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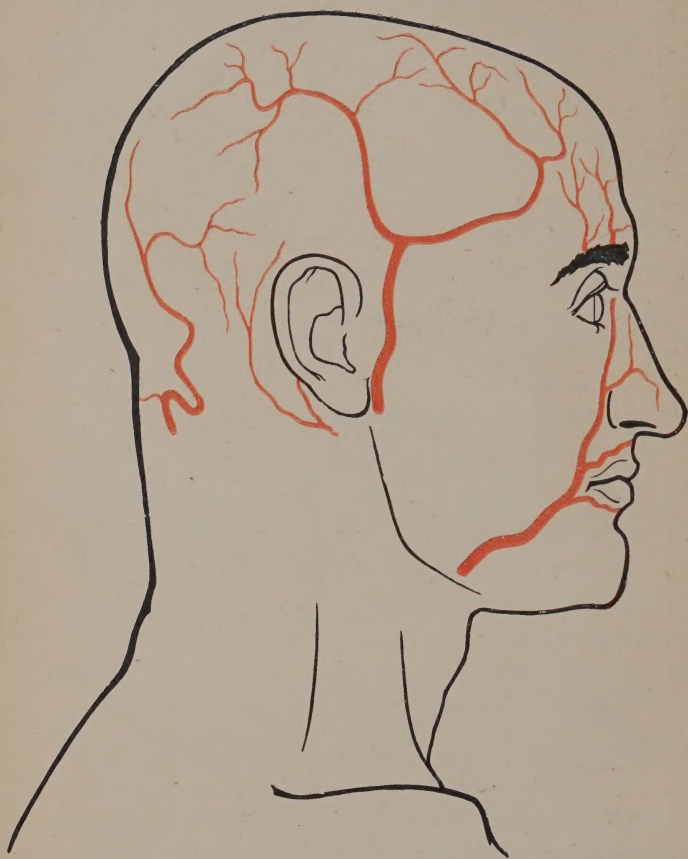
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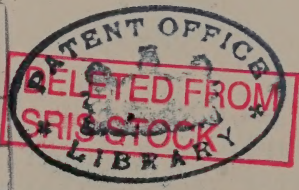
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PUBLISHERS' NOTE TO THIRD EDITION.

THIS Edition has been revised, corrected, and brought up to date. A new Diet Scale, recommended by the Board of Trade, has been added to those given in the Second Edition.

May, 1905.

PREFACE TO THE SECOND EDITION.

IN the preparation of a Second Edition of the *Shipmaster's Medical and Surgical Help and First Aid*, endeavour has been made to enhance its utility by adapting it to fresh requirements, especially to those due to the recent issue by the Board of Trade of important and beneficial modifications in the Scales of Medicines and of Medical Stores and Comforts. An addition has been made to the Appendix of a new Emergency Scale for ships making short voyages, and also of revised Scales for Emigrant Ships. The author returns grateful acknowledgments for suggestions and corrections that have been communicated from time to time, and has sought to take full advantage of such help in the revision of this new issue.

W. JOHNSON SMITH.

SEAMEN'S HOSPITAL,
GREENWICH, April 20, 1900.



P R E F A C E.

7.5.19.

THE main objects of this Manual for the use of Masters and Officers of the Mercantile Marine are to afford some help in the treatment of injury and disease occurring at sea, and under other local conditions in which there may be no possibility of obtaining professional assistance, and to stimulate an active interest in the instruction of Ambulance Associations. An endeavour has been made throughout the volume to adapt the instruction and hints on practical points to the means and appliances placed at the disposal of Ships' Officers by the authorised scales of the Board of Trade.

Much of the instruction here given, especially that relating to grave infectious fevers and other internal affections, deals rather with the prevention of disease and the nursing and feeding of sick men than with active medical treatment. The author would impress on his readers that, except in cases of extreme urgency, less harm is likely to result in the absence of qualified aid from simply warding off further evil and promoting the comfort and physical strength of the patient, than from an active interference with the use of surgical instruments or of strong remedies.

Many useful suggestions, together with much kindly encouragement, from Dr. W. Collingridge, Medical Officer

of Health for the Port of London, are here gratefully acknowledged.

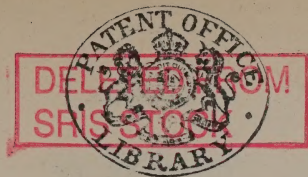
The author has to express his thanks to Messrs. Charles Griffin & Company for permission to make use of many woodcuts from the Manuals of Dr. Humphry and Dr. Riddell, the *Surgeon's Pocket-Book* of Messrs. Porter and Godwin, and other works issued by this Firm.

He is also indebted to Messrs. J. & A. Churchill for permission to include amongst the illustrations a figure of Mr. Armstrong's sling-stretcher, and to Mr. Charles Dibdin for the use of woodcuts prepared for the Royal National Life-Boat Institution.

A Chapter on Cooking on board ship and the preparation of Food both for healthy men and invalids has been prepared for this book by Mr. T. F. Adkins, Instructor in Nautical Cookery to the Well Street Sailors' Home.

W. JOHNSON SMITH.

SEAMEN'S HOSPITAL,
GREENWICH, *June, 1895.*



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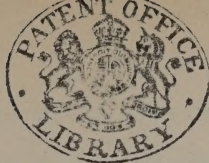
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MEDICAL HELP

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CHAPTER I.

PRESERVATION OF HEALTH ON BOARD SHIP.

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—CONDITIONS OF A SAILOR'S LIFE.

THE calling of a sailor, unlike many other occupations, may be said to have no malady peculiar to itself. Sea-sickness very rarely attacks the workers on board ship, and scurvy is ever ready to follow, on shore, in the tracks of war and famine.

Conditions Favourable and Unfavourable.—The one favourable condition that a sailor's work is performed in fresh and pure air, is counteracted by a host of influences unfavourable to good health and prolonged life. These may be briefly classified thus:—

(1) His duties are very laborious, and often necessitate a long maintained strain of mental anxiety and incessant muscular action.

(2) His special temptations when he is on shore induce irregular habits and immoderate indulgence.

(3) He is much exposed to the physical evils of both cold and hot climates, and to sudden changes from extreme heat to extreme cold, and from dry to moist air.

(4) His diet is more or less artificial, and, however good in quality and quantity, must, in long voyages, be a monotonous one.

(5) His accommodation on board ship is defective with regard both to air space and protection against heat, damp, and cold.

(6) The harbour and its immediate surroundings are usually the most unhealthy parts of a large port.

(7) The nature of a sailor's work exposes him to the risks of drowning and of very severe injury.

Tendency to Certain Diseases.—The frequency amongst sailors of **internal aneurism**, of **heart disease**, of **emphysema of the lungs**, and of **ruptures**, may be attributed in great measure to their active and prolonged exertions. As a rule, able seamen, and even those who have led healthy and temperate lives, become prematurely aged.

The prevalence among seamen of **venereal disease**, **syphilis**, and **alcoholism** is well known.

Influences of Climate.—The influences of a hot climate in producing debility, liver disease, and nervous depression, and of a cold climate in exciting chest disease and impoverishment of the blood, affect those who have lived for some time in such climates much more than men who make but a short stay in one place. Seamen seem to suffer most from heat when passing into the tropics, being then subject to attacks of **prickly heat**, **diarrhœa**, and a mild form of **continued fever**. **Heat stroke**, is not a frequent affection, and attacks mostly stokers. On the other hand, a sudden **exposure** to damp and cold is apt to excite **rheumatism** and **bronchial affections**. The effects of a tropical climate are most marked in those seamen who have suffered from malarial fever, or who have been laid up on shore in a hot country with a severe injury or some exhausting disease. In one respect, however, a visit to a hot country, short as it may be, acts most injuriously on the health of ships' crews. As a result of carelessness, and their habit, when on shore, of frequenting the lowest and most unhealthy parts of a port, sailors are very liable to contract any infectious fever that may be prevalent there, and to suffer from the worst forms of tropical epidemic disease. Hence the high rate of mortality in the Mercantile Marine from **yellow fever**, **continued fevers**, and **cholera**, and the frequency amongst seamen of **malaria** and **dysentery**.

Effects of Dieting.—The use of the same dietary under the most varying conditions of climate must necessarily be prejudicial to health. If, as seems to be the case on most ocean-going vessels, the scale is adapted to the requirements of a temperate climate, the men will probably consume too much in hot weather, and find their food insufficient when they are

exposed to the rigours of high latitudes. The sameness of the food, the use of salt and preserved meat, the occasional failure in the preservation both of meat and vegetables, and faulty cooking, are all causes of those **disturbances of digestion** from which so many seamen suffer. The occurrence of **scurvy**, there can be no doubt, is due to an absence from the dietary of a proper supply of vegetable food, or of the anti-scorbutic elements of such food which are contained in lime and lemon juice.

Berths and Cabins.—The berthing of men, as also of passengers on board ship, necessitates more restricted space and less pure air than can be obtained in dwellings on shore. If the vessel be a wooden one, its shell will absorb moisture; if it be constructed of iron, its enclosed spaces will become very hot in warm weather, and very cold in higher latitudes. Moreover, there is much “sweating” in iron ships; and, in vessels of all kinds, the air between decks and in berths and cabins is liable to become loaded with moisture in consequence of the frequent cleansing of the decks, and of the exposure of the upper deck to sea-water and rain. To these conditions may be attributed the prevalence amongst seamen of **consumption, bronchitis, chronic rheumatism**, together with more or less **general debility** and a feeble constitutional resistance to the effects of injury and severe disease.

Port Conditions.—If, in a malarious district, a vessel be moored close to the bank of a tidal river, in a creek, or even a short distance from the sea-shore, the men may contract **malarial fever** (intermittent and remittent). A land-locked harbour is, in many instances, the receptacle for the sewage of a large and unhealthy town, which may produce **diarrhoea** and **sore throat**. During his shoreleave the seaman seldom goes beyond those districts of a sea-port which are the main haunts of **typhus** and **typhoid fevers, smallpox**, and other forms of infectious disease.

Other Injurious Influences.—Besides the above there are other injurious influences which may occasionally affect the health of ships’ crews. Among these may be mentioned **infectious and foul cargoes, bad water, insufficient clothing, failure of rations on long voyages, exposure and hardship after wreck**.

Statistics of Disease.—Of 2,249 deaths in British vessels reported to the Registrar General of Shipping and Seamen in 1886-87, and appropriated to the year 1886, 1,439 were attributed to accident—1,291 to drowning, and 148 to other accidental causes. This return does not include the number of deaths in

fishing vessels, in which the mortality from accidental causes amounted in 1886 to 91·47 per cent. of the total number of deaths.

The relative death-rate in the Merchant Service, though it has fallen nearly 54 per cent. in the course of the past twenty-five years, is still very high when compared with that of the Royal Navy.*

The most frequent causes of death in the 810 fatal cases from disease in Merchant vessels appropriated to the year 1886, were: continued fever (120 cases), heart disease (87), diseases of the brain and nervous system (93), diarrhœa (63), consumption (62), diseases of the respiratory organs (61), cholera (54), yellow fever (42), and dysentery (37).

The death-rate from disease is higher in sailing than in steam vessels, being 4·22 per 1000 in the former, and 2·93 per 1000 in the latter. The difference in the rates of mortality would be much increased by adding the accidental deaths, as in 1886 there were 873 losses from drowning and injury in sailing ships and 467 in steamers.

Preventive Measures.—Whilst many diseases which seamen are liable to contract may be regarded as due to the inevitable conditions of their calling, or to their own incorrigible carelessness, there are others which are undoubtedly preventable, or which may be kept within very close bounds by care and attention. That much can be done under conditions which would be now considered as very unfavourable, is proved by the successful efforts of Collingwood, Cook, and Murray, to maintain the health and comfort of those entrusted to their charge. Much, too, has been done of late years in this direction. The number of cases of scurvy has certainly diminished very much in British vessels during the past ten years, and frost-bite, which was formerly a serious scourge amongst the coloured crews of East Indiamen, is now very rarely seen in the large steamers which have replaced them. There are, however, other serious diseases, which, there are good reasons to believe, may be much reduced, if not abolished altogether, on board ship, by a more general adoption of hygienic measures.

Phthisis, there can be no doubt, would be materially decreased by better ventilation, better sleeping accommodation, and, above all, by medical inspection of seamen.

The Strain of Work to which heart disease is so often due is a necessary result of any tendency to reduced manning of a crew.

* Rates of mortality in the Royal Navy, 1891, 6·17 per 1000.

”	”	”	1892, 5·58	”
”	”	Merchant Vessels, 1886,	9·93	”

Enteric Fever, Dysentery, and Cholera, it should always be remembered, may be due to infected water.

Dyspepsia, and a host of complaints to which disorders of the digestive organs may give rise, may be prevented to a considerable extent, not only by improving and varying the dietary, but by taking care that it is properly cooked.

Rheumatism, in both its acute and chronic state, might be much diminished by some attention to the clothing of seamen and by efforts to overcome the evils and discomforts of a "wet ship."

THE SHIP.

In ships, as in houses, the most favourable structural conditions with regard to the health of those who live in them, are such as afford abundant space, free ventilation, good light, freedom from damp, and facilities for the prompt removal of sewage and foul fluids.

Relative Advantages—(1) Of Small and Large Ships.—In small ships, in consequence of the restricted space, the cabins and forecastles may be small, close, and badly lighted; much of the space appropriated to the crew may be occupied by lumber, and the men deprived of proper and convenient places for hanging up their wet clothes, for cleaning themselves, and for keeping their food. In large sailing vessels the abundant deck space permits of such ample and comfortable accommodation as would be impossible in smaller craft. The larger the vessel, however, the greater become the difficulties of efficient ventilation.

(2) Of Iron and Wooden Ships.—Other things being equal, an iron vessel is in many respects more healthy than one constructed of wood. The former material is sound and does not absorb moisture, whilst wood is liable to rot, and takes up and retains, not only water, but also the germs of putrefaction and disease. In iron ships the bilge fluid is less offensive. A wooden ship, however, is cooler in hot, and warmer in cold weather than one of iron. The "sweating" on the partitions of the quarters of an iron ship, from the condensation of moist vapour on the cool metal, is a serious evil.

(3) Of Steam and Sailing Ships.—In steam ships there is more crowding of the crew than in sailing ships, but, usually, a better supply of fresh provisions. Although, as a rule, steamers make worse weather than sailing ships, the deck hands have less hard work and severe strain; on the other hand, those

engaged below are exposed to accidents from the machinery, and to the dangers of the very hot and often badly ventilated stoke-hold.

Ventilation.—The general ventilation of every ship is a matter of great importance. Although in trading vessels the spaces “between decks” are not occupied, as in men-of-war and passenger ships, by large numbers of persons, the air, if not constantly renewed, is rendered foul and poisonous by the exhalation from the bilge fluid, and often from the cargo. The ventilation of holds may, in most instances, be properly carried out by means of cowled ventilators, shafts, hollow masts, wind-sails, and, if the cargo become heated, by removal of the hatches during good weather. As, however, cowled ventilators and shafts do not fulfil every object of good ventilation, and from their elevation above deck have to be closed and are liable to be washed away in stormy weather, many methods of artificial ventilation have been devised, most of which unfortunately can only be used in large steamers and in vessels furnished with costly appliances for the comfort of passengers. Amongst these may be mentioned the modifications of Perkin’s Automatic Ventilator; which method, as its action is dependent on the motion of the ship, is quite useless when ventilation is often most needed.

The following useful suggestions as to the ventilating of Merchant ships are contained in the German Guide for the use of Captains :—*

Rules for the Ventilation of Merchant Ships.

“(1) In general, when the hatches are open, there travels through the interior of ships a current of air in a direction contrary to that of the wind; for instance, if the wind be aft, the air within the ship travels from fore to aft, therefore the largest quantity of air is introduced into the ship by assisting the existing current of air, that is by turning the weather ventilators off the wind and the lee ventilators on to the wind. But in cases where the hold contains cargo injurious to health, the ventilators for the hold must be, as much as possible, set in such a manner as to cause the expelled air to travel so high above the deck that the men working there do not inhale it.

“(2) Every division must be separately ventilated. Therefore a ventilator for the hold must not, at the same time, serve for ventilating the cabin or fore-castle.

“(3) Renewal of air can only take place when there are *two* openings, one to admit the fresh air, and the other to carry off the foul air.

“(4) The cowled ventilators and shafts must be as large as possible and overtop the rails. Wind-bags and wind-sails alone are not sufficient for

* *Anleitung zur Gesundheitspflege an Bord von Kauffahrteischiffen.*

the proper ventilation of the ship; they may, however, contribute in fair weather and in port. Very particular care must be bestowed on the ventilation of the stoke-holds and engine-rooms."

Bilge Water.—This is usually more offensive and probably more injurious to health in old wooden ships than it is in iron vessels. In the former it contains more sea-water, and also the products of the decomposition of sodden and rotting wood, whilst in the latter the ironwork exercises on it a certain amount of antiseptic and purifying action.* In every class of ship, however, it is very necessary, particularly in warm climates, to pay attention to the water collected in the bilges, which acted upon by heat, and mixed with refuse of all kinds, with dead vermin, and in steamers with oil, may be regarded as a **foul and dangerous sewer**. There can be no doubt that the well should be frequently pumped out, and as much as possible of the fluid removed. Whether the whole can be cleared out is open to question, and, notwithstanding the almost general advocacy of the so-called "dry" method of treating bilges, the plan favoured by Dr. Collingridge of adding, after the well has been pumped dry, a certain amount of clean sea-water, seems to be more rational; as, by such action, the deposit in the bilges, which is probably more dangerous than the bilge water itself, may thus be dissolved and washed away. The use of disinfectants would in most vessels, and especially in large ones, be simply a waste of material. The bad smell might be removed or replaced by one equally unpleasant, but it would be quite impossible to bring the disinfecting agent into contact with every possible source of disease. Moreover, such attempt to deal with the evil of bilge water might lead to the neglect of other and more effectual precautions. In steamers, however, the use of deodorants is often very necessary for removing the smell of the engine-room bilges.

Cargoes.—Acute infectious diseases, such as cholera, small-pox, and scarlet fever may be caught from dirty rags. A quantity of decomposing meat, fish, or vegetable matter will certainly prove very offensive, and very probably injurious to health. The handling of skins and horns may cause a virulent and usually fatal kind of boil.

Unhealthy Cargoes.—The following cargoes may be considered as unhealthy:—Bones, guano and manure, hair, sorted rags, fresh skins, rotten grain, turpentine, green coffee, and live cattle.

Dangerous Cargoes—There are cargoes which may prove a

* Fleet-Surgeon Coppinger, R.N., *Davidson's Hygiene and Diseases of Warm Climates*.

source of calamity both to ship and crew by becoming heated and causing fire. Among the most dangerous of these may be mentioned cotton, flax, lime, sugar, rice, and other grains, and especially coal. In steam ships carrying much coal, as also in colliers, there is often a risk, unless the coal bunker be properly ventilated, of an explosion, or of poisoning of the air in the berths and between decks, in consequence of the liberation of marsh gas, and of carbonic acid gas (carbon dioxide) during a sudden fall of the barometer, or in hot weather.

THE CREW.

Medical Inspection of Seamen.—As it is clearly a matter of great importance, both to the owners and the master, to have a sound and healthy crew on board ship, it seems strange that so little has been done to carry out the 10th Section of the Merchant Shipping Act, with respect to the medical inspection of seamen. Although a close and regular examination is made of candidates for the Royal Navy, and a long list of disqualifying defects and affections has been embodied in the Admiralty Instructions, no such test is demanded in the case of Merchant seamen, nor has even a list of simple instructions for the use of masters been issued by the Board of Trade. The necessity for such examination is recognised by the Officers of the Marine Service of the United States, who insist, in an official hand-book, “that no vessel should proceed to sea *unless the men comprising the crew have been examined by a competent surgeon, and pronounced physically able seamen.*”

The German Guide (*Anleitung zur Gesundheitspflege*) for the use of Captains of Merchant Ships, attaches great importance to this matter, and submits as the first object to be considered a series of useful instructions for the guidance of a medical inspector or of the captain himself. There can be no doubt that, by such examination of men before the commencement of a voyage, much would be done to improve the general health of ships' crews. An outbreak of infectious fever might thus possibly be avoided, together with the evils of compulsory undermanning in consequence of the unexpected illness of some two or more men. Again, a disease which might have been cured by early treatment may be rendered chronic and incurable if the patient is allowed to expose himself to the most unfavourable conditions of recovery. If, as is now believed, consumption may be caught by one person from another, the presence of a phthisical patient in a close and damp fore-castle, occupied by

the whole of one watch, may be the primary cause of incalculable mischief and suffering. There is nothing that gives more trouble and annoyance to the master of a vessel than the presence of one or more sick men in his crew, and yet little is done to diminish the risks of so serious a mishap.

Points to be Noted.

(1) With regard to age, young men are as a rule to be preferred, but in ships trading to the tropics, the crew should contain a fair proportion of healthy, middle-aged seamen, who have seen some service.

(2) An able seaman should be strong and active, well developed, and free from any defect or malformation of the limbs.

(3) The sight, hearing, and the ability of distinguishing one colour from another, should be tested. (See Appendix.)

(4) The teeth should be looked to. A man is considered as unfit for the Royal Navy if seven of his teeth are deficient or defective—unless under special circumstances—or if the biting or grinding capacity is seriously impaired, owing to a smaller number of decayed teeth, for instance, three or four incisors, or four molars in the same jaw.

(5) Men suffering from epilepsy, heart disease, consumption, or shortness of breath should be rejected. Pallor of the face and lips, sunken eyes, hollow cheeks, prominent shoulder-blades, and wasted muscles, are all signs of disease or debility.

(6) Men suffering from any of the following affections cannot be regarded as fit for service at sea:—Rupture, varicose veins, fistula, ulcers, and swollen testicle, or large and rapidly growing tumours.

(7) As smallpox often spreads rapidly on board ship and wherever seamen are collected together, enquiry should be made as to vaccination. All men and boys entering the naval service are re-vaccinated, and if no results follow the operation, a second one has invariably to be performed.

ACCOMMODATION.

Berthing.—There can be no question that the lower *forecastle* (which happily is now seldom met with, save in small wooden vessels) is a very poor habitation for seamen. It is in most instances dark and small, and, consequently, liable to become dirty and to be badly ventilated. Of the *top-gallant forecastle* and *deck-house* the latter is decidedly preferable on hygienic grounds, as it is more readily accessible, more roomy, and affords a better supply of fresh air and light. The objection that the deck-house may interfere with the working of the ship is contrary to experience, as it is now commonly adopted in new sailing vessels, and has long been used in Scandinavian and other foreign craft. The top-gallant forecastle is often low, and its shape necessitates a waste of room, and favours an accumulation of trunks and lumber, which take up much of the limited amount of cubic space allowed to the men. The plan adopted in many

large steamships of berthing the crew aft is a good one, as the men, both deck hands and firemen, are less exposed to heavy seas in bad weather, and they have much less difficulty in keeping their quarters dry and clean. The plan of berthing the crew amidships in a steamer is not so advantageous, as the quarters are close to the engines, and consequently very warm and noisy.

A deck-house or a top-gallant forecastle, to be thoroughly satisfactory from a hygienic point of view, should fulfil the following requirements:—

REQUIREMENTS FOR HEALTHY QUARTERS.

- (1) It should be at least 6 feet in height from deck to beams.
- (2) To permit a good supply of fresh air and light, it should be provided with one or more skylights and side scuttles in the proportion of one to every two bunks; also with two or more "cowled" ventilators.
- (3) The fore-and-aft bulkhead or partition, if there be one, should not reach to the deck above, but leave a free space for the air to pass from one side to the other.
- (4) The inside, including the partitions and upper deck, and also the bunks, should be painted white, or some light colour, with enamel or glazed paint which will dry quickly.
- (5) The flooring should be firm and solid; if it consist of boards on bearers over an iron deck the space between the iron and the wood should be filled in with cement and sand.
- (6) The mess table should be a movable one, and capable of being slung up.
- (7) The bunks should not be arranged in more than two rows, one above the other: if there be a fore-and-aft bulkhead the bunks should be placed along this, opposite to the side scuttles. This plan should always be carried out, if practicable, in berths containing one or a very few bunks. There should be a free space of 12 inches at least between the lower tier of bunks and the deck below (*Dr. Collingridge**). For seamen, as for passengers under the Passenger Act, the distance between each tier of bunks and between the uppermost tier and the deck above should not be less than $2\frac{1}{2}$ feet.
- (8) There should be a small space separated by a partition from that occupied by the crew, in which the men can hang up wet clothes, and also a safe, outside the deck-house or forecastle, to contain their food.
- (9) The door should be a hinged and not a sliding one; the best kind of door is one consisting of two parts, one above the other, which can be put together so as to form a single solid door in bad weather.

There is very little difficulty in dealing with the sweating on the sides, stringers, and beams of an iron deck-house, due to the condensation of moisture, but the means of preventing this are not always free from objection. A continuous wooden lining will harbour vermin and dirt, whilst the use of granulated cork, which, on the whole, is an excellent plan, is likely, if not properly carried out, to produce a rough surface which soon becomes dirty and breaks down when scrubbed.

* "Practical Points in the Hygiene of Ships and Quarantine," *Lancet*, May 5th, 1894.

In many new vessels, most, if not all, of these conditions of an efficient deck-house have been observed. Indeed, so far has the desire to promote the comfort as well as the health of crews been carried, that instances have lately been recorded of the supply to each seamen of a separate berth, having more than double the space required by law, and provided with washing accommodation, and drawers and shelf.* In spite of these improvements, however, but little attention is paid in some ships to the cleanliness and good order of the men's quarters, and in too many instances the modern top-gallant forecandle, or the deck-house, may, like the forecandle of Mr. Lindsay's time, be described as a "foulsome and suffocating abode."† The quarters should be frequently inspected, and kept constantly clean in every part, so that there will be no necessity at any time to use an excess of water. The lockers should be kept tidy and free from accumulations of food, and the bedding be well aired on deck, or in the rigging, at least twice a week during fine weather.

In most large vessels a fair and sufficient space is allotted to each man, notwithstanding the legal freedom allowed to owners and masters to crowd their men together to an extent that is certainly not conducive to good health. With the present tendency to reduced manning of ships, many of the bunks, usually about one-fourth, remain unoccupied, and where there is free communication of air between one side of the forecandle or deck-house and the other, or where there is no bulkhead, and the crew live in a common open space, the allowance to each man is doubled, as at sea one half of the crew must be on deck. Free communication is, unfortunately, often very objectionable to the men, as in sailing ships one watch desires to keep aloof from the other, and in steamers the seamen are disposed to think much of their privilege of being berthed on the starboard, or captain's side.

Separate berths containing two or more bunks are often badly ventilated, and when occupied by fore-mast hands or petty officers, are apt to become untidy, and be encumbered by lumber.

Latrines.—The most common evils in water-closet accommodation on board ship are bad ventilation, defective flushing arrangements, and proximity to the occupied quarters. The soil-pipes are sometimes too short, ending too far above the

* Armstrong on Marine Hygiene. A treatise on *Hygiene and Public Health*, edited by Stevenson and Murphy.

† *Merchant Shipping and Ancient Commerce*, W. S. Lindsay, vol. ii., p. 497.

water line. The best position for a closet, according to Armstrong, though not, perhaps, the most convenient, is the after-part of the ship, so that the soil pipe may shoot over or through the counter near the rudder trunk. When the vessel is in dock the closets and privies should be thoroughly cleaned and disinfected, and then locked up until the beginning of the next voyage.

Washing.—Good provision should be made, especially in the tropics, for personal washing and the washing of clothes. A place, the floor of which should be covered with sheet-lead or concrete, may, without any inconvenience, be appropriated for the former purpose in a large ship; and in a steamer it would be well, if it be possible, to have a separate place for the stokers. Tubs will be found more useful than basins. The most convenient bath for the use of seamen is a high and narrow one, in which a man can stand or squat. An ordinary long bath should always be provided for use in cases of sickness.

FOOD.

Notwithstanding the recommendations of the Board of Trade made in 1882 with regard to the dieting of Merchant seamen, the old scale, with its blank columns and "schedule of substitutes at the master's option," is still used in many ships. Much has certainly been done to mend matters by the "Rules for the Inspection of Provisions and Water," issued in 1893; but still this scale, which has never really been an authorised one, is open to serious objection. It is too monotonous, contains too much animal and too little vegetable matter, and compels those who accept it to live on the same food in the most varying conditions of climate and weather. Its chief faults are the predominance of salted meat, and the absence of meat and vegetables preserved by modern methods. In 1883 Mr. Spooner, who has done so much to improve the dietary of seamen, drew out a scale for the Board of Trade, which has directed attention to the evils of the old scale, and has led to the adoption in many instances of an improved and more liberal supply of food on board ships. In this suggested scale preserved meat is substituted for salt meat three days in the week; the quantity of meat altogether is reduced, while potatoes and carrots, either fresh or preserved, butter, oatmeal, rice, marmalade, raisins, molasses, suet, and pickles are added.* Another scale, in some respects more liberal,

* "Dietary Scales in connection with the health of Seamen." W. Spooner, *Transactions of the Seventh International Congress of Hygiene and Demography*, 1891.

but more "permissive" in character, has been suggested by the Shipping Federation.

With an improved dietary, such as that recommended by Mr. Spooner, and by adding, when opportunities offer, occasional supplies of fresh meat and vegetables, a master should not fail to maintain both good discipline and good general health in his crew. He would be able to vary the diet from time to time in accordance with the variations of climate, and would thus prevent, in times of enforced idleness and great heat, a waste of such kind of food as might be needed in excessive cold and bad weather. These changes, if changes are to be made, must be carried out by the master, for it would be impossible to frame, for men serving at sea, two or more fixed dietaries for use in different climates.

Diet for Hot Climates.—In hot countries the diet should be a light one, and consist of food that is readily digested. Less meat—and that fresh or preserved, not salted—should be given, and an abundance of vegetables. Fluid, which will of course be taken in increased quantity, should be cold; water in small draughts, cold tea, lime or lemon drink, oatmeal and water with sugar (Prescription No. I.). Spirits must be strictly avoided.

Diet for Cold Climates.—In cold climates an increased supply of meat with fatty or greasy food will be needed, together with hot coffee or cocoa, and if the crew be worked hard and much exposed, a glass for each man of spirits and hot water.

General Rule.—Exposure to cold and active muscular exertion at sea demand a full diet of animal and fatty food; idleness and hot weather a light and vegetable diet.

At sea every man should take hot tea or coffee early in the morning.

The Testing of Provisions.

Meat.—Good fresh meat is firm and elastic to the touch, moist, but not wet, and, except in the case of pork, veal, and lamb, bright red in colour. (To test this, an iron or wooden skewer should be thrust into its centre, and rapidly withdrawn and smelt.) The fat should contain no watery juice or jelly; the suet fat should be hard and ivory white (*Vacher*). Meat should be rejected if it be soft and pulpy and of a dark or greyish colour, and if the fat be discoloured or stained by blood.

Fresh pork is often infected, being either studded by numerous small but distinctly visible bladders, containing a clear fluid (measly pork); or speckled over by minute white dots not so easily seen. In the former case the pork, if not thoroughly cooked, will give rise to tape-worm; and in the latter, to the severe disease known as trichinosis. In a foreign port, and especially in the Baltic, beef and mutton should be preferred to pork.

Meat loses some of its nutritive properties when salted; so that salt meat may be replaced by a smaller quantity of fresh or preserved meat. Salt pork, however, loses less of its nutritive elements than salt beef, and also, being less indigestible when pickled, is superior as an article of diet to the latter. A rough test applied by Germans to prove the right strength of pickle is to throw in a potato which, when it rises to the surface and swims, shows that enough salt has been added.

Preserved meat, though not very palatable by itself, is capable in the hands of an experienced cook of being served up in many ways. It is certainly, when good, more nutritious than an equal quantity of salt meat. When a tin of preserved meat has been opened its contents should be consumed at once, as such meat when exposed to the air very soon becomes putrid.

Fish.—“The freshness of a fish is indicated by its being firm and stiff. In really prime condition if held out in a horizontal position by the hand, it will remain rigid. Any drooping of the tail shows that it is not quite fresh, and the extent of the drooping may not unfairly be taken as a measure of want of freshness in the fish” (*Vacher*).

Fish, whether salted or preserved, is not a suitable addition to a ship's dietary, as it is a poor and not very acceptable substitute for meat. Tinned fish, when tainted, is liable to cause serious symptoms. Fresh fish caught in tropical waters should not be eaten, as it is difficult to distinguish harmless and edible fish from those that are very poisonous.*

Butter, if included in the dietary, should be pure, pale, and firm butter, and not margarine. If it become rancid it should be kneaded in cold fresh water, and afterwards in a weak solution of bicarbonate of soda (two teaspoonfuls to a pint of water).

Vegetables.—In addition to preserved and pickled vegetables, a good supply of fresh potatoes, carrots, and onions should be taken on board for the use of the crew. These, if properly stored (see Chapter xxxii.), should last for at least six weeks. Fresh green vegetables when they can be procured, should also be taken on board at every port.† Much trouble and cost may be thus prevented, and although the time has not yet come when

* A list of tropical poisonous fishes is given by Fleet-Surgeon Coppinger, R.N., in *Davidson's Hygiene and Diseases of Warm Climates*, p. 109.

† The German *Anleitung zur Gesundheitspflege an Bord von Kauffahrt-eischiffen*, gives a list of foreign substitutes for articles of a ship's dietary:—

For Flour.—Sago, tapioca (Cassava, Yuka, Maniok in West Indies and tropical parts of South America), arrowroot, macaroni.

For Peas.—Lentils (*Quinchinchos*, *Angfouti*, *Xhora-Paërou*, *Ambrevade*, Brazilian Angola-Pea) in West Indies, the tropical parts of South America, and Africa, China, and Japan.

For Beans.—The black bean and the *Caraotas blancos* in Brazil; the Mungo bean in the East Indies, the Strait Settlements and China; the Soja bean in Japan.

For Cooking Fruits.—American dried apples, currants, and raisins in the Mediterranean, dried peaches (*duraznos*) in Chili, the *Kakis* in Japan.

For Potatoes.—Sweet potatoes, artichokes, yams.

Other Antiscorbutics.—Tomatoes, gourds, melons, bread-fruit.

Caution is necessary in using the Taro (in the West Indies called *Eldo*, in the South Pacific Islands *Dalo* and *Scalo*, in Brazil *Ynhame*, *Igname*, and *Tacovas*). This is a very nourishing root, but contains a poisonous constituent, which, however, may be destroyed by boiling in water.

the official instructions with regard to lime-juice can justifiably be relaxed, it may be hoped that a more general and liberal provision of vegetables will soon lead to the removal from future dietaries of this artificial substitute for natural food.

Flour.—This must be of fine grade, and milled from fully matured good sound wheat. It should, when shipped, be dry and soft to the touch, and be free from a musty smell. According to the instructions of the Board of Trade, it must be either shipped in new and light barrels made from seasoned wood and lined with suitable paper, or stored in tanks that have been thoroughly cleansed, limed with fresh lime, and dried.

Biscuits when shipped must be thoroughly baked, and made of fully matured wheat flour. They should be hard, dry, and crisp, not soft and “dusty,” and free from “mouldy” smell.

Cooking.—As the best dietary may be rendered useless by bad cooking, and as the discipline and efficiency of a crew depend very much on the manner in which their food is prepared and served, the master should take care that there is a good cook on board his ship. He will find no difficulty in this matter in home ports, as the persevering efforts of Miss Calder of Liverpool to train adult cooks, have been recently supported in London by the County Council in association with the authorities of the Sailors' Home, and by other bodies. In the London “Home,” and also in Liverpool, Glasgow, and North Shields, excellent classes of cookery have recently been established, in which, in addition to a certificate of efficiency in cooking, marks are given for cleanliness, sobriety, order, and good conduct.

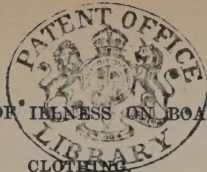
Water.—The supply of fresh water to each man for his own purposes should not be less than 1 gallon per diem. In home ports care is usually taken that it is renewed either directly from the main, or from a water-boat fitted with an iron tank, and then stored on board in large protected iron tanks. If it can be avoided, the water-boat should not come alongside in rough weather, lest salt or brackish water find its way into the tank, and the drinking water be shaken up with its deposit. If it be found necessary to take in water abroad, it should be remembered that, as a rule, running water is preferable to stagnant water. Water from a spring, though “hard” is generally free from organic impurity; water from a river contains decomposed organic matter, and often more or less sewage; water from a shallow well or from any stagnant and shallow lake or pond should always be suspected as being very likely mixed with both impure organic ingredients and active germs of disease.

The safest water for drinking purposes, though it is not absolutely pure, is distilled and aerated water, as by distillation disease germs are destroyed, and both organic matter and salts

are got rid of. The unpleasant oily taste which is a frequent addition to the many objections against distilled water, may, it is stated, be removed by placing in it a small piece of iron wire or a rusty nail. "Hard" water is usually rendered "soft" by the addition of lime water. Organic (dead animal and vegetable) impurities may be indicated by the colour and "dirtiness" of the water, or be detected by adding to a sample a few drops of Condyl's fluid. If the water when shaken remains a pink or light purple colour it may be regarded as good, if, on the other hand, it becomes brown and turbid, it is certainly not pure. Drinking water that is dirty and discoloured may be deprived of its suspended impurities by filtration. If, though clear, it has a putrid smell it should be boiled or distilled. The germs of acute infective diseases, such as cholera, yellow fever, enteric fever, and those also of malarial fever, though often associated with visible organic impurities in water, are often present in water that is clear and sparkling, and apparently of excellent quality. In all districts, therefore, in which such fevers are prevalent, and where there are good reasons for suspecting the drinking water, it should always be well boiled before it is used either for drinking or cooking purposes, or else be replaced by distilled water. *Boiling, it should always be borne in mind, is the only means of rendering bad and polluted water absolutely safe.*

Filtering.—When the drinking water is discoloured and evidently full of organic matter, it should be filtered. If there be no proper filter on board for the use of the crew, a simple one can be easily made. After the carpenter has bored in the bottom of a clean deck bucket about fifteen holes, each $\frac{1}{2}$ an inch in diameter, a layer of pieces of holystone, each about the size of a walnut, should be placed inside over these holes, and on the top of this another layer about 2 inches in depth of other pieces of holystone of the size of Barcelona nuts. Over these two layers should finally be placed a layer, also 2 inches in depth, of clean sand. Pieces of charred wood might be mixed with the smaller pieces of holystone. The bucket when filled should be suspended over another placed so as to receive the filtered water. A filter of this kind will be found to act very effectually and to be a better method than adding to the impure water, alum, tea-leaves, coffee, or old iron.

Tanks.—The water left in the ship's tanks at the end of a voyage should all be completely emptied, and the tanks thoroughly cleansed and refilled with good fresh water.



The clothing of seamen should always be made up of woollen material, which is permeable by air, and a bad conductor of heat. Cotton material is generally worn by firemen. Seamen, as a rule, are badly supplied with clothing, and in temperate climates many have the habit of wearing all the underclothing they possess at the same time, so that a man when requested to strip for a medical examination has often to take off, besides his jacket, three or more shirts. This unhealthy habit is especially common amongst Scandinavian sailors.

CHAPTER II.

TREATMENT OF ILLNESS ON BOARD SHIP.

THE SHIP "HOSPITAL"—NURSING—THE PATIENT—THE ATTENDANT—
DISINFECTION—INFECTIOUS DISEASES—PRECAUTIONS.

THE provision for treating sick and injured men on board ship is, as a rule, very limited, and there is, almost necessarily, much difficulty in ensuring, in such cases, the required amount of rest and comfort. This difficulty, however, and that of finding suitable means and appliances, may, in most instances, and especially in large and well-appointed ships, be overcome by the intelligence of officers, and the general readiness of seamen to meet emergencies, and apply means at hand to new and special purposes.

The Ship "Hospital."—A Seaman who is "laid up" and requires nursing should, if possible, be removed from the quarters occupied by the rest of the crew, and special care should be taken to isolate cases of certain contagious diseases, such as smallpox, scarlatina, and typhus fever (for the care of which see p. 60 *et seq.*). In many new vessels a cabin is set apart as a "hospital," and there can be no doubt that in most ocean-going vessels some special arrangement of this kind could be easily made. As much hospital accommodation should be afforded to seamen as to passengers under the "Passenger Act," which provides 18 clear superficial feet for every fifty persons. The place used as a hospital should be as far removed as possible from the occupied quarters, well venti-

ventilated, and, above all, well lighted. It should be furnished with an iron bedstead accessible on every side, and not, as is usually the case, with a couple of small and badly situated bunks. If there be no bedstead, the bunks should not be placed one above the other, but one on each side fore and aft, and clear of the ports. It should also be provided with two firm mattresses, and a good and special supply of clean bed-linen, with a thick rug, blankets, and waterproof sheeting. In the absence of the last-mentioned article a table cover of American leather will serve in cases in which the sheets may become soiled by the patient's discharges. In warm climates and settled weather a tent hospital can be readily run up on deck, or the helpless patient, together with his bed and linen, can be laid on a small boat in the chocks or upright on the skids, and covered by a sloped awning.

Nursing.—In every serious case in which the patient is bed-ridden and quite helpless, and requires almost constant attention, a man should be "told off" to act as a nurse. Such attendant ought to be steady and reliable, and, if the patient be suffering from smallpox, or typhoid, or any other "catching" fever, endeavour should be made to select a man who has already had the same disease. Although the difficulties in the way of nursing are very great on board ship at sea, much may be done by an intelligent man acting under proper instructions to relieve suffering, to prolong, and, it may be, to save, the patient's life, and in cases of infectious disease to prevent sickness in others.

The sick-cabin should be well ventilated, the port and door being kept constantly open in warm weather, and opened from time to time, if it be for only a few seconds, if the weather be bad. While keeping the room cool and airy, the attendant must take care that the patient is not exposed to a draught.

The cabin must be kept scrupulously clean. It should contain nothing, besides the bunk or bedstead with bed and linen, but a stool, the necessary utensils for the patient, and one small locker or table. In good weather the deck and partitions should be swept and dusted every morning, not washed down with water.

The patient should rest on a firm mattress; the under sheet should be clean and dry, and *be kept smooth*. The patient's covering, save in bad weather and in cases of collapse, should be light, and in hot weather, be raised from the bed and patient by cords fixed to the beams.

The patient should be kept clean; his hair cut short, and the whole body washed every day, one limb or part of the body being exposed for this purpose, whilst the rest is covered.

The nourishment should never be "forced" on the patient, but be given in very small quantity at a time, and frequently. *No crumbs should be allowed to collect on the under sheet or the body linen.*

In cases in which there is much diarrhœa, or discharge of any kind from the patient, the under sheet should be frequently changed, or a layer of waterproof sheeting be placed under the body. If there be a very frequent discharge of watery stools, a thick pad of oakum should be placed between the thighs and under the buttocks. In cases of cholera, typhus and typhoid, and other infectious fevers, all stained bed-linen should be placed in a large tub containing a solution of carbolic acid (1 part to 20 of water), and afterwards cleansed by boiling water. All stools, vomit, phlegm, and other discharges from the patient should at once be thrown overboard, and all rags and useless linen burnt.

If the patient be helpless and cannot sit up in bed, a bar of wood suspended within his reach by a piece of rope from the beams will often enable him to raise his body whilst the bed is being made.

The attendant should, especially in cases of infectious disease, attend to himself as well as to the patient, washing his hands frequently in weak carbolic solution (1 part of acid to 40 parts of water), and taking care not to eat his own food whilst his fingers are dirty and soiled. He should in such cases be dressed in an old but clean suit, which can be burnt when his duties as nurse have come to an end.

If the patient smell badly and the air of the sick-cabin be foul in spite of free ventilation, the deck-floor may be sprinkled with coffee every morning after it has been swept; or a few coffee beans may be roasted from time to time on a heated shovel.

Disinfection.—By disinfection is meant the destruction of the germs or poisonous agents of infectious or contagious diseases, such as smallpox, typhus and typhoid fever, yellow fever, cholera, &c.

A *disinfectant*, strictly speaking, is an agent which destroys such germs, whilst a *deodorant* destroys or disguises foul and offensive odours. The distinction between the two is not well marked, but it should be borne in mind that not every agent that removes a bad smell is capable of destroying the germs of disease.

There are many disinfectants, some of which are gaseous, some soluble in water, and others available only in a solid form. The most useful are those which can be widely distributed in the air

or over large surfaces. They differ much in strength, some, like corrosive sublimate, chloride of zinc (Burnett's fluid), and carbolic acid, being very powerful; whilst others, like permanganate of potash (Condy's fluid), are much less active unless used in large quantities. The strongest disinfectants are very poisonous, and cannot be used on board ship without great risk.

The best disinfectant is heat above the boiling point of water (212°F.). For this reason all rags and useless soft material that have been in contact with a patient suffering from cholera, smallpox, or any infectious disease should be burnt, while the bed and personal linen, together with much of the outside clothing, should be thoroughly cleansed in boiling water.

The most useful disinfectant for general use in a sick cabin or small hospital on board ship is a solution of carbolic acid (1 part of acid to 20 parts of water). This should be used for sprinkling over the deck and partitions, mixing with stools and other discharges, purifying all stained linen, and cleansing the hands of the attendant.

For disinfecting a sick-berth or any enclosed space the best agents are sulphur and chlorine. As the fumes of burning sulphur and chlorine gas are poisonous and very irritating to the lungs, the chamber must be carefully closed during the process of disinfection.

Precautions.—The following precautions, or as many of these as can be possibly carried out, should be observed in dealing on board ship at sea with a case of smallpox, scarlet fever, typhus or typhoid fever, yellow fever, or cholera.

The first question to settle in case of any man presenting suspicious or decided symptoms of one of the above-mentioned diseases would be that as to *where* he should be kept—whether or not he should be removed from his quarters to a sick-berth or some other quarters. The answer to this will depend very much upon circumstances. As a rule, the patient should be left where he is, and the rest of the crew or those occupying the same quarters be removed to another part of the ship. By removing the patient two centres or starting-points of infection would be established, both of which it would be necessary, sooner or later, to disinfect. There would of course be much difficulty in removing the crew in a small ship, and there might, in a large vessel, be a very suitable and isolated sick-berth, in which the patient could be treated under much more favourable conditions than in the deck-house or fore-castle. It would be well in such circumstances for the captain to be guided by the following suggestions:—In a case of smallpox or typhus fever the

patient should be left and the rest of the crew removed; whilst in cholera and other diseases he might be removed, provided his clothing be taken with him, his bed destroyed, and the quarters thoroughly fumigated before they are again occupied by the rest of the crew.

The place in which the patient is treated should be kept cool and well ventilated. In warm and good weather the door should be kept open, and the entrance covered by a curtain of linen or canvas, which should be frequently sprinkled over with carbolic acid solution.

The stools and vomit, especially in cases of cholera and typhoid fever, should at once be covered by some carbolic acid solution (1 to 20) and thrown overboard. All fouled bed-linen should be washed in carbolic acid solution and afterwards boiled.

The attendant, who must devote the whole of his time to the sick man, and not mix with any of the crew, must keep himself very clean, and carefully wash his hands in carbolic acid solution (1 to 40) after contact with the patient.

The deck and partitions of the sick-berth should be frequently sprinkled with carbolic acid solution.

In case of death after any infectious disease, the body should be enclosed without delay in a sheet thoroughly saturated with carbolic acid solution, and over this a bag of tarred canvas. The clothing and bed-linen of the deceased, if not destroyed (which would be by far the best plan), should be dipped in weak carbolic acid solution, and enclosed in a bag of tarred canvas. The bed should be burnt or thrown overboard.

After the removal of a patient suffering from an infectious disease, nothing should be taken away from the sick-berth or quarters formerly occupied by him until such place has been thoroughly disinfected.

The usual, and simplest, way of disinfecting an enclosed place that has been occupied by a sick man, is to break up about $\frac{1}{2}$ lb. of sulphur, and to burn this by adding some red-hot coal, in a soup-tin or iron pan, which should rest on a couple of iron rods placed across a tub of water. Every opening into the berth should be carefully closed, and all crevices stopped with tow. After an interval of six hours the quarters should be opened, and the deck, beams, and partitions, together with any locker or table, thoroughly scrubbed with a solution of carbolic acid. As a final precaution, the inside should be painted or lime-washed.

As there is some risk of fire by burning sulphur in this way, it would be advisable to carry out some other method in a ship laden with an inflammable cargo. Chlorine may be obtained by

placing $\frac{1}{2}$ lb. of chloride of lime in a canvas bag, and immersing this in a mixture of 1 pint of hydrochloric acid (spirit of salt) diluted with 4 pints of water. The berth, however, must be very carefully closed at every aperture before this is done, as the gas given off is extremely irritating to the throat and chest. Enchlorine, which is less objectionable in this respect, may be produced by adding spirits of salts (hydrochloric acid) to chlorate of potash. A very good method, probably the best, of disinfecting a chamber of any kind, is to use sulphurous acid (sulphur dioxide), already prepared and stored in metal cylinders.

For the disinfection of bilges, if very offensive, especially those under the engine-room, carbolic acid (1 pint to 5 gallons of water) will be found very suitable.

For removing the bad smell of a sick-berth Condry's fluid, if sprinkled over the deck and mixed with foul stools and discharges, will be found useful. Coffee, also, is a good deodorant. Some beans should be roasted on a hot shovel, or the powdered coffee be scattered over the deck.

For Dieting of Invalids, see Chapter xxxii.

CHAPTER III.

THE MEDICINE CHEST.*

OFFICIAL SCALE OF MEDICINES FOR MERCHANT SHIPS—PLACE FOR KEEPING THE MEDICINES—CHANGE OF THE MEDICINES—WEIGHTS AND MEASURES—OFFICIAL GUIDE-BOOKS—BOARD OF TRADE LIST OF MEDICINES AND MEDICAL STORES—USES OF THE MEDICINES AND EXTERNAL APPLICATIONS INCLUDED IN THE BOARD OF TRADE LIST.

Official Scale of Medicines.—Much attention has evidently been directed to the Scale of Medicines for Merchant ships, as it has been frequently revised. In its latest form, issued May,

* In the Merchant Shipping Act of 1867 it is provided that—The Board of Trade shall from time to time issue, and cause to be published, Scales of Medicine and Medical Stores suitable for different ships and voyages, and shall also prepare or sanction a book or books containing instructions for dispensing the same.

The owners of every ship navigating between the United Kingdom and any place out of the same, shall provide and cause to be kept on board such ship a supply of medicines and medical stores in accordance with the scale appropriate to the said ship, and also a copy of the said book, or one of the said books, containing instructions.

1894, it contains a list of forty-five medicinal agents for internal and external use, which must be included in the Chest, and an additional list of drugs which are recommended. This scale, which contains more articles than any list of a like kind that has been issued abroad, is a very satisfactory one, and is well adapted to meet every need that might occur to an unprofessional person in charge of a body of men. It contains for the most part remedies in common use, which are reliable and safe, and includes but very few which, even in the most careless hands, might do harm. The permission usually given to a medical officer on board ship to add to the scale at his own discretion, ought never to be granted to the master, who might, perhaps, use some powerful agent or some patent medicine of unknown composition, for which there is no place in the crowded chest, or which might be kept in a compartment intended for some mild and harmless remedy.

Place for Keeping the Medicines.—The medicines are in most ships kept in the medicine chest, but in some few are ranged on shelves. With the latter plan the bottles are exposed to view and there is less risk of a mistake; but, on the other hand, they are more exposed to light and atmospheric change, which might affect their contents, and they are more liable to be broken. Moreover, when removed from the chest they may be withdrawn to some extent from the custody of the master.

Charge of the Medicines.—The charge of a medicine chest, and the proper administration of its contents, may in the course of a long voyage give the master much trouble and anxiety. Medicines if not kept in a cool and dark place may undergo change, some becoming concentrated in consequence of the evaporation of spirit, and others be spoilt by the action of excessive heat or cold. There is often a difficulty in dispensing the remedies, the uncustomary work of weighing a fine powder or measuring a few drops of tincture being embarrassing to the officer, especially during press of work or bad weather. Again, there is the risk of a bottle being broken and its contents lost or mixed with other drugs. Most of these mishaps and troubles might be prevented by the use of drugs in a compressed form, of which there are now several preparations, presenting the advantages of being readily dispensed and of occupying very little space. The well-known "tabloids" of Messrs. Burroughs and Welcome, who have lately paid much attention to ships' medicine chests,* seem to be well adapted to the needs of foreign

* Messrs. Burroughs and Welcome have prepared medicine chests for Merchant ships containing many of the prescribed articles in "tabloid" form, and also a specially fitted case for use on board yachts. (See Appendix.)

service. These preparations have been used with success on board ship, and their constancy of strength in warm climates and during long periods has been proved by the testimony of the late Dr. Parke, who, in the Emin Pacha Relief Expedition, found them superior to all other drug preparations, both in convenience of portability in transit, and in unfailing reliability in strength of doses after prolonged exposure.

Weights and Measures.—The medicine chest contains a set of scales and weights and two glass measures. Care should be taken that the weights are marked as the Board of Trade directs, with English words and figures, thus: 1 grain, 20 grains, 1 dram, not as sometimes happens—gr. i, $\mathfrak{D}\text{i}$, $\mathfrak{S}\text{i}$. Of the two glasses, one is a drop measure for strong tinctures, which is marked to dispense 1 dram, the graduated scale being divided into 40 drops. The second and larger glass measures from

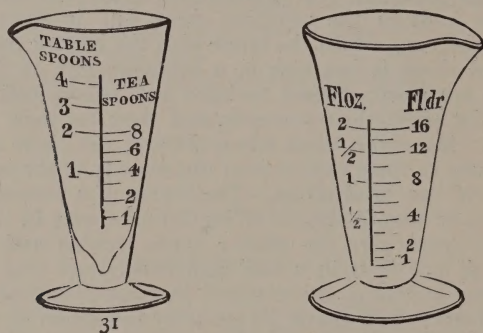


Fig. 1.—Measure Glasses.

1 dram to 2 ounces, and is marked for ounces and drams on one side, and for the equivalent numbers of tablespoonfuls and teaspoonfuls on the other. In making up a draught composed of one or more tinctures and a solid, the tincture should be measured in the small, or drop, glass, and then poured into the large, or ounce, glass containing the required quantity of water—1 or 2 ounces—previously mixed with the solid, either in a tabloid holding the proper dose, or in the ordinary form, which has been carefully weighed. The whole should be stirred with a spoon or glass rod before it is given to the patient.

One ounce is equal to two tablespoonfuls.

One dram (40 drops) is equal to one teaspoonful.

A wineglass contains about 2 ounces.

An ordinary teacup contains about 4 ounces.

A tumbler contains about half a pint.

Each bottle and jar should always be kept in the same place, and in case one be broken the empty space should be filled up by tow, oakum, or paper until a fresh supply of the same drug can be obtained. The bottles should be kept clean and in good order, and the scales and measure glasses always carefully cleaned after they have been used. The precaution should always be taken of looking at the label both *before* and *after* dispensing any medicine. The names of all external applications are printed in thick black letters.

Every medicine chest must contain an authorised book of instructions for dispensing its contents in cases of disease and emergency. The book that has been in use for many years is the well-known *Ship Captain's Medical Guide*, which was compiled by Dr. Harry Leach in 1868, and has since been ably revised from time to time by Mr. W. Spooner. This, which has served as a model for foreign works of a similar kind, is still one of the best, being clear, concise, and admirably adapted to its special requirements.

In the revised instructions* issued by the Board of Trade in November, 1899, considerable attention has evidently been directed to the list of medical stores and comforts, with the result of rendering this portion of the scale much more comprehensive and useful. The master in charge of the appliances prescribed by this revised list has now sufficient means of dealing with even serious forms of injury, and the inclusion of a clinical thermometer will afford him an instrument, by the simple and ready use of which he cannot fail to find much help in making out the nature and severity of many cases of disease. He has now at his disposal a fair and varied supply of antiseptic agents, such, for instance, as carbolic acid, cyanide gauze, iodoform, and boric acid, by means of which he can devise appliances for "first-aid" use, and also suitable dressings for sores and open wounds. For ordinary sponges, which are a source of danger when brought near a wound, are substituted aseptically prepared sponges, stored in hermetically sealed bottles. An important insertion is that of "a filter manufactured on the

* For recently revised Medical Scales for Emigrant Ships, and also an Emergency Medical Scale for Merchant Ships making short voyages, see *Appendix K*, p. 323.

Pasteur principle," by means of which water, whether used for drinking or for cleansing of wounds and sores, can be sterilised and deprived of disease germs. By these additions, and by the substitution of modern for cumbersome and obsolete appliances, this portion of the scale has been much improved.

LIST OF OFFICIAL GUIDE BOOKS FOR THE USE OF SHIP
CAPTAINS PUBLISHED IN DIFFERENT COUNTRIES.

England.—*The Ship Captain's Medical Guide*, compiled by Harry Leach, M.R.C.P., revised by Wm. Spooner, Medical Inspector of the Board of Trade. London, 1901.

United States.—*Handbook for the Ship's Medicine Chest, Marine Hospital Service*. Washington. 1904.

Germany.—*Anleitung zur Gesundheitspflege an Bord von Kauffahrteischiffen, auf Veranlassung des Staatssekretars des Innern bearbeitet im Kaiserlichen Gesundheitsamte*. Berlin, 1902.

Instruction on the Preservation of Health on Board Merchant Ships, prepared by order of the Secretary of State for the Interior, by the Imperial Board of Health.

Norway.—*Veiledning i Sundhedspleie og Sygebehandling ombord i Handelsskibe. Udgivet efter Foranstaltning af Departementet for det Indre*. Forlagt af Jacob Dybwad, 1891.

V. Uchermann.—*Lægebog for Somænd. Veiledning for Skibsforere og Styrmand i Sundheds- og Sygepleie ombord i Handelsskibe*. Forlagt af H. Aschehoug & Co., 1902.

Manual of Hygiene and of the Treatment of Disease on Board Mercantile Vessels. Published by Appointment of the Home Department. Jacob Dybwad, Publisher, 1891.

V. Uchermann.—*Handbook of Medicine for Seafaring Men. A Guide for Shipmasters and Officers to the Hygiene and Treatment of the Sick on Board Mercantile Vessels*. Published by H. Aschehoug & Co., 1902.

Denmark.—*Lægebog for Sofarende, af Overlæge W. Hornemann, 6^{de} Oplag*; Kjöbenhavn, 1882. Hornemann's *Lægebog for Sofarende, 8^{de} Oplag*, ginnemset og til Dels omarbejdet af Overlæge, Dr. med. Breuning-Storm, Kjöbenhavn, 1905.

Medical Book for Mariners, by Fleet-Surgeon W. Hornemann. Sixth Edition. Copenhagen, 1882; and the same book in the Eighth Edition, revised and partly remodelled by Fleet-Surgeon Breuning-Storm. Copenhagen, 1905.

SCALE OF MEDICINES AND MEDICAL STORES, ISSUED BY THE BOARD OF TRADE
IN PURSUANCE OF THE MERCHANT SHIPPING ACT, 1894.

Revised, January, 1900.

<i>a.</i> Preparations from British Pharmacopœia, 1898. This Column is added for the use of Druggists supplying the Medicines indicated. All bottles to be stoppered, and the official dose for an adult to be stated on the label. All medicines indicated thus (*) to be marked with a Red Poison Label.	<i>b.</i> Names of Medicines, Medicaments, &c. All Medicines bearing a Red Poison Label must be used with caution, and if given internally should be carefully measured.	<i>c.</i> Proportion for Ships carrying the under-mentioned No. of Men and Boys (for 12 months).			
		10 and under.	11 to 20 inclusive.	21 to 40 inclusive.	41 and upwards.
Sp. Ammon. Aromat., . . .	Alum, Aromatic Spirits of Ammonia.	2 ozs. 4 "	4 ozs. 6 "	6 ozs. 8 "	8 ozs. 12 "
Copaiba,	Balsam of Copaiba, . . . Bicarbonate of Potash, . . Bicarbonate of Soda, . . .	4 " 4 " 8 "	8 " 6 " 12 "	12 " 8 " 16 "	16 " 10 " 20 "
Mist. Sennæ Co.,	Black Draught,	2 pts.	4 pts.	6 pts.	8 pts.
Lotio Hydrarg. Nigra, . .	Black Wash,	1 pint.	2 "	2 "	3 "
Liq. Epispasticus,	*Blistering Fluid, Bromide of Ammonium, . .	1 oz. 2 ozs.	1 oz. 4 ozs.	2 ozs. 6 "	2 ozs. 8 "
Hyd. Subchloridum, . . .	*Calomel, Camphor,	1 oz. 2 ozs.	1 oz. 4 ozs.	1 oz. 6 ozs.	1 oz. 8 ozs.
Acidum Carbolicum Liquefactum.	*Carbolic Acid, liquefied, .	4 "	6 "	8 "	12 "
A liquid containing not less than 80 per cent of free Carbolic or Cresylic Acid.	†Carbolic Acid or other disinfectant of approved quality.	1 gal.	2 gals.	4 gals.	4 gals.
Linimentum Calcis,	Carron Oil, Castor Oil,	1 pint. 2 lbs.	1 pint 4 lbs.	2 pts. 6 lbs.	3 pts. 8 lbs.
Argenti Nitras induratus, .	*Caustic,	$\frac{1}{2}$ oz.	$\frac{1}{2}$ oz.	1 oz.	1 oz.
Tinct. Chlorof. et Morph. Comp.	*Compound Tincture of Chloroform and Morphine. (To be used in place of Chlorodyne.)	1 "	2 ozs.	3 ozs.	4 ozs.
Creosotum,	Creosote,	$\frac{1}{2}$ "	1 oz.	1 oz.	1 oz.
Liq. Potass. Permang., . . .	†Crimson Fluid,	$\frac{1}{2}$ pint.	1 pint	1 pint	2 pts.
Acid. Sulph. Arora,	Elixir of Vitriol,	2 ozs.	4 ozs.	6 ozs.	8 ozs.
Tr. Zingib. Fortior, B.P., '85, .	Epsom Salts,	3 lbs.	6 lbs.	10 lbs.	12 lbs.
Ess. Ment. Pip., B.P., '85, . .	Essence of Ginger, " Peppermint,	1 oz. 1 "	2 ozs. 2 "	3 ozs. 3 "	4 ozs. 4 "
Tr. Benzoin. Comp.,	Friars' Balsam,	4 ozs.	6 "	8 "	10 "
Liq. Plumbi Subacet. Fort., .	*Goulard's Extract,	1 oz.	2 "	4 "	6 "

† As antiseptic and deodorising agents for common use. Samples of the disinfectants supplied will be occasionally taken for analysis, to determine whether they fulfil the requirements of the Board of Trade.

‡ For purifying drinking water when necessary.

a.	b.	c.			
		10 and under.	11 to 20 inclusive.	21 to 40 inclusive.	41 and upwards.
Potass. Iodid.,	Iodide of Potassium,	2 ozs.	2 ozs.	3 ozs.	4 ozs.
Liq. Iodi. Fortis,	*Iodine—strong solution of,	1 oz.	2 „	3 „	4 „
	*Iodoform,	6 drs.	8 drs.	10 drs.	12 drs.
Tinct. Opii,	*Laudanum,	4 ozs.	6 ozs.	8 ozs.	10 ozs.
Add 2 drs. of powdered camphor to each pound.	Linseed Meal,	14 lbs.	14 lbs.	28 lbs.	28 lbs.
Charta Sinapis,	Mustard Leaves (in tins),	12	24	24	24
	Nitrate of Potash,	4 ozs.	6 ozs.	8 ozs.	10 ozs.
	Olive Oil,	4 „	8 „	12 „	16 „
Lin. Opii,	*Opodeldoc,	6 „	8 „	10 „	12 „
Tinct. Camph. Comp.,	*Paregoric,	4 „	6 „	8 „	10 „
All pills to be coated with gel- atine.	Pil. Hydrarg. (4 grs.),	4 doz.	6 doz.	8 doz.	10 doz.
	„ Ipecac. c. Scilla (4 grs.),	4 „	4 „	6 „	8 „
	„ Sapon Comp. (2 grs.),	2 „	2 „	3 „	4 „
	„ Coloc. Comp. (4 grs.),	6 „	12 „	16 „	20 „
	*Powder, Dover's,	1 oz.	2 ozs.	3 ozs.	4 ozs.
Pulv. Ipecac. Comp.,	„ Ipecac.,	1 „	2 „	3 „	4 „
„ „ (to be supplied in tins).	§Quinine,	1 „	2 „	3 „	4 „
Sodii Salicylas,	Salicylate of Soda,	4 ozs.	8 „	12 „	16 „
Spiritus Chloroformi,	Spirit of Chloroform,	4 „	6 „	8 „	10 „
	Sulphate of Zinc,	1 oz.	2 „	3 „	4 „
	Sulphur (sublimed),	1 lb.	1 lb.	2 lbs.	3 lbs.
Sp. Ætheris Nitrosi,	Sweet Spirits of Nitre,	6 ozs.	6 ozs.	8 ozs.	10 ozs.
Acidum Tartaricum,	Tartaric Acid,	4 „	6 „	8 „	10 „
Tinc. Ferri Perchlor.,	Tincture of Steel,	4 „	4 „	6 „	8 „
Lin. Terebinth,	Turpentine Liniment,	8 „	10 „	12 „	16 „
Ext. Hamamelidis Liquidum,	Witch Hazel,	1 oz.	1 oz.	2 „	2 „
OINTMENTS.					
Ungt. Acidi Borici,	Boric Acid,	4 ozs.	6 ozs.	8 ozs.	10 ozs.
„ Gallæ cum Opio,	Galls and Opium,	1 oz.	2 „	3 „	4 „
„ Hydrarg.,	Mercurial,	2 ozs.	2 „	4 „	6 „
„ Sulph.,	Sulphur,	8 „	12 „	16 „	16 „
„ Hydrarg. Ammon.,	White Precipitate,	2 „	2 „	4 „	6 „
Paraffinum Molle,	Vaseline or Salvo Petrolia,	12 „	12 „	16 „	24 „

§ Treble the quantity above indicated to be taken to all tropical ports.

For voyages of six months and under, half the quantity of the above medicines may be carried.

There is a separate scale for voyages of less than five days from port to port.

a. PARTICULARS.	b. Scales of Medical Stores and Necessaries.	c. Proportion for Ships carrying the under-mentioned No. of Men and Boys (for 12 months).			
		10 and under.	11 to 20 inclu- sive.	21 to 40 inclu- sive.	41 and up- wards.
1 <i>grain</i>, 2 <i>grains</i>, &c., must be stamped in English figures and words on each respective weight, the word <i>scruple</i> must not be used at all (the scruple weight being marked 20 <i>grains</i>) the $\frac{1}{2}$ <i>drachm</i>, 1 <i>drachm</i>, and 2 <i>drachm</i> weights must be also marked in English figures and words. The filter must be tested in the Government Laboratories. The fluid 2-oz. measure must be marked in <i>ounces</i> and <i>drachms</i>, <i>table-spoonfuls</i> and <i>teaspoonfuls</i>.	Scales and weights, . . .	1 set	1 set	1 set	1 set
	Rubber plaster in tin case,	1 yd.	2 yds.	3 yds.	4 yds.
	Boric lint,	$\frac{1}{2}$ lb.	$\frac{3}{4}$ lb.	1 lb.	1 lb.
	Absorbent cotton wool, .	$\frac{1}{2}$ lb.	$\frac{3}{4}$ „	1 „	1 „
	Double cyanide gauze, .	1 yd.	1 yd.	2 yds.	2 yds.
	A filter manufactured on the Pasteur-Chamberland principle of filtration, 2 galls.	1	1	1	1
	Graduated drop measure, .	1	1	1	1
	Graduated 2-oz. measure, .	1	1	1	1
	6-oz. bottles,	1 doz.	1 doz.	2 doz.	2 doz.
	Corks for bottles, . . .	1 „	2 „	3 „	4 „
Leg and arm size, Triangular bandage, base 48 ins., sides 33 ins. each. Flannel bandage, 7 yds. long, 6 ins. wide.	Scissors,	1 pair	1 pair	1 pair	1 pair
	Syringes, $\frac{1}{2}$ -oz.,	2	2	4	4
	Abscess knife, Paget's, .	1	1	1	1
	Eye spud,	1	1	1	1
	Bandages,	3	6	6	8
	Triangular bandages, . .	2	3	4	4
	Flannel bandages, . . .	1	2	3	4
	Calico,	2 yds.	3 yds.	4 yds.	6 yds.
	Flannel,	2 „	3 „	4 „	6 „
	Needles, in vaseline, . .	6	6	6	6
Printed directions for use, .	Tablet of silk, with four sizes.	1	1	1	1
	Safety Pins,	3 doz.	3 doz.	3 doz.	3 doz.
	Splints, common, . . .	1 set	1 set	1 set	1 set
	Enema syringe (Higginson's).	1	1	2	2
	Esmarch's tourniquet (plain, with hooks).	1	1	1	1

a.	b.	c.			
		10 and under.	11 to 20 inclusive.	21 to 40 inclusive.	41 and upwards.
	Soft olive-headed catheters.	3	3	3	3
36 in. single reversible, . . .	Trusses,	1	2	3	3
36 in. double,	„	1	1	1	1
	Sponges, aseptically prepared, in hermetically sealed bottles containing 1 doz.	1 bott.	1 bott.	1 bott.	1 bott.
	Plaster of Paris bandages (in tins) prepared for use.	1 doz.	1 doz.	2 doz.	2 doz.
	Clinical thermometer, self-registering.	1	1	1	1
	Camel's hair pencils, . .	1	1	2	2
	Bed-pan,	1	1	1	1
	Authorised Book of Directions for Medicine Chests (The Ship Captain's Medical Guide, latest edition).	1	1	1	1
	Oatmeal,	4 lbs.	8 lbs.	16 lbs.	24 lbs.
	Arrowroot,	2 „	4 „	8 „	12 „
	Pearl barley,	4 „	8 „	16 „	24 „
	Corn flour,	4 „	8 „	16 „	24 „
	Sago or cerealine, . . .	4 „	8 „	16 „	24 „
	Sugar,	14 „	28 „	42 „	56 „
	Soup and bouilli, . . .	6 „	12 „	24 „	36 „
	Boiled mutton,	6 „	12 „	24 „	36 „
	Essence of meat ($\frac{1}{2}$ pint), .	6 tins	12 tins.	24 tins	36 tins
Preserved	Desiccated soup, . . .	4 lbs.	8 lbs.	16 lbs.	24 lbs.
	Vegetables, dried or compressed.	4 „	8 „	16 „	24 „
	Potato (if not in scale of provisions).	14 „	28 „	56 „	74 „
	Wine (port),	3 bottles.	6 bottles.	12 bottles.	18 bottles.
	Brandy,	2 „	4 „	6 „	8 „

USES OF MEDICINES AND EXTERNAL APPLICATIONS INCLUDED
IN THE BOARD OF TRADE SCALE.

MEDICINES FOR INTERNAL USE.

The dose of each of these must be reduced by one half for patients under the age of fifteen.

1. **Aromatic Spirits of Ammonia.**—Well known as sal volatile. It is a mild stimulant, and is often useful in cases of bilious headache, and of pain in the stomach and faintness after meals. Dose from a half to a full teaspoonful in 2 tablespoonfuls of water.

2. **Balsam of Copaiba** (*Copaiba*) is useful in cases of gonorrhœa (clap) in which there is but slight scalding and no fever. As it will not mix with water alone, it should be rubbed in a mortar or small basin with the yolk of an egg and some sweet spirits of nitre (see prescription No. 2). The dose is from 20 to 40 drops. This drug may cause indigestion and sickness, and occasionally produces a rash which may be mistaken for measles.

3. **Bicarbonate of Potash**, given in doses of from 5 to 20 grains, will be found beneficial in cases of rheumatic fever, and also in the early stage of gonorrhœa when there is much scalding. The addition of a teaspoonful of this salt to half a tumblerful of warm water, in which the same quantity of tartaric acid (No. 32) has been dissolved, will form a useful effervescing mixture, suitable in cases of fever and vomiting.

4. **Bicarbonate of Soda.**—A white powder, soluble in water, useful in doses of from 5 grains to half a dram in cases of indigestion and heart-burn, and also when moistened with cold water as an application to insect stings.

5. **Black Draught*** (*Mistura Sennæ Composita*).—A very efficient purgative, and useful in cases of constipation. As senna is an active drug and apt to cause griping, the black draught should not be given if there be any swelling or tenderness of the belly. The dose is from 2 to 3 tablespoonfuls.

6. **Bromide of Ammonium** (*Ammonii Bromidum*).—This is an invaluable medicine for soothing the patient and favouring sleep, in cases of restlessness and delirium. It is particularly useful in delirium tremens, and, being a safe remedy, is a good substitute for laudanum and other sleep-producing drugs, which,

* The Latin name is given when a like preparation can be obtained in a foreign port and is known there by the same name.

unless carefully given, are liable to do serious mischief. Dose 5 to 30 grains in 2 tablespoonfuls of water.

7. **Calomel** (*Hydrargyri Subchloridum*).—This drug, though a preparation of mercury and *needing great caution in its use*, is indispensable in certain cases. It is useful as a purgative (5 grains) in cases of apoplexy, in jaundice, and cases of malarious and yellow fever. It may be given also in smaller doses (1 or 2 grains) in syphilitic inflammation of the eyes (Iritis, see Chapter xxvii.), and in dropsy due to disease of the liver. It should always be given as a powder, unless otherwise prescribed by a medical man, and be mixed with a little sugar or flour, and not in a larger dose than 5 grains.

8. **Camphor** (*Camphora*) is useful in small doses in cases of flatulence; in large doses it acts as a stimulant, and as such it may be tried in almost hopeless cases of collapse and prostration in typhoid fever, delirium tremens, and cholera. A good way of giving it in such cases has been recommended by Mr. Spooner—2 ounces of camphor are dissolved in half a pint of whisky, brandy, or any other spirit, and 5 drops of this solution are given in a tablespoonful of hot brandy and water every quarter of an hour. Dose of camphor, from 2 to 8 grains.

9. **Castor Oil** (*Oleum Ricini*).—A sure and speedy, and yet mild, aperient. It is useful not only in cases of obstinate constipation, but also in those of colic and of diarrhœa, caused by some irritant, as fruit, bad meat, &c. It may be given in a cup of strong sweetened coffee. The dose is from 1 to 2 tablespoonfuls. A drop of castor oil put into the eye will give much relief after the removal of a foreign body.

10. **Compound Tincture of Chloroform and Morphine** (*Tinctura Chloroformi et Morphineæ Composita*).—This is directed to be used in place of chlorodyne. It will be found useful as a sedative in cases of neuralgic headache, fever, troublesome cough, and restlessness. It has been found beneficial also in painful affections of the bowels, such as colic, diarrhœa, and dysentery. The dose is from 5 to 10 drops.

11. **Creosote**.—One drop of this liquid given on a small bread pill will often do good in cases of obstinate and severe vomiting. It is used more frequently as an external application (see p. 36).

12. **Elixir of Vitriol** (*Acidum Sulphuricum Aromaticum*).—Useful in doses of from 5 to 15 drops in cases of diarrhœa. When added to a mixture of water and quinine will cause the latter to be dissolved.

13. **Epsom Salts** (*Magnesiæ Sulphas*).—Minute clear crystals

with a bitter taste, and readily dissolved in water. A very useful purgative which, in ordinary cases of constipation, may be repeated without causing griping or sickness. Dose from 2 drams to half an ounce, given in a tumbler of warm water before the first meal.

14. **Essence of Ginger** (*Tinctura Zingiberis Fortior*).—Used in cases of flatulency and, like essence of peppermint, for preventing griping. It may be added to iodide of potassium when this disagrees with the stomach. Dose from 5 to 20 drops.

15. **Essence of Peppermint**.—Useful for relieving colic and, when added to purgative draughts, for preventing griping pains. Dose from 10 to 20 drops, which, when the essence is given without any other drug, should be poured on sugar.

16. **Iodide of Potassium** (*Potassii Iodidum*).—Large milky-white crystals freely soluble in water. This is much used in cases of old syphilis and of chronic rheumatism. Dose from 2 to 15 grains. When given in large doses, and to persons very susceptible to its action, it is apt to cause sickness, headache, running at the eyes and nose, and other troublesome symptoms (see Chapter xxx.).

17. **Laudanum*** (*Tinctura Opii*).—A black fluid, about 15 drops of which contain 1 grain of opium. Acts speedily and beneficially in producing sleep and relieving pain, and is a useful help to other drugs in treating diarrhœa. Is apt to cause headache, sickness, and constipation, and must be used with much caution. Dose from 8 to 15 drops. If it be necessary to repeat the dose not more than 40 drops (1 dram) should be given in the course of twenty-four hours.

18. **Nitre or Saltpetre** (*Potassii Nitras*).—When dissolved in water in doses of from 5 to 10 grains is a useful cooling medicine in fever, and acts also on the kidneys, causing an increased flow of urine. It is used as a wash for sore mouth in cases of salivation, and as a gargle for sore and inflamed throat (2 drams to half a pint of water). When given internally it often causes griping, and in a large dose will act as an irritant poison (see Chapter xxx.). The inhalation of the fumes from burnt strips of blotting-paper previously dipped in a solution of nitre (1 dram to 4 of water) and dried will give relief in cases of asthma.

19. **Paregoric** (*Tinctura Camphoræ Composita*).—A light brown fluid, 1 dram of which contains one-fourth of a grain

* The laudanum sold in Europe and the United States is stronger than the British preparation; slightly so in most countries, but in Austria double the strength.

of opium.* Very useful for relieving troublesome cough in cases of neglected cold, of chronic bronchitis, and of consumption. Dose from 15 to 40 drops.

20. *Pills*.—*Blue Pill* (*Pilula Hydrargyri*).—Useful in bilious attacks, and in the treatment of syphilis, but, save in very exceptional cases, *should not be given unless ordered by a medical man*.

21. *Cough Pill*.—This is made up of ipecacuanha, squill, and ammoniacum. It will be found useful and harmless in cases of troublesome dry cough from neglected cold. Dose 4 grains.

22. *Opium Pill* (*Pilula Saponis Composita*).—Five grains contain 1 grain of opium. Dose 2 grains. Used for the same purposes as laudanum, but is not so speedy nor so certain in its action.

23. *Purging Pill*.—Composed of colocynth, aloes, and other purgatives. Is a strong and effective purgative, and useful in cases of obstinate constipation. Dose 4 grains. This medicine should be given at night in one or two pills, and be assisted on the following morning by a small dose of castor oil or Epsom salts.

24. *Powders*.—*Dover's Powder* (*Pulvis Ipecacuanhæ Compositus*).—A light fawn-coloured powder, 10 grains of which contain 1 grain of opium. Dose from 5 to 10 grains. Relieves pain and restlessness, and also produces sweating. Is useful, if given at night, in cases of severe cold; also in small and repeated doses, in cases of dysentery and painful diarrhœa. Not more than half a dram should be given in the course of twenty-four hours.

25. *Ipecacuanha Powder* (*Ipecacuan*).—An indispensable article in every medicine chest, being a reliable and safe emetic, and an invaluable remedy in cases of dysentery. It is also useful as a local application to insect stings. Dose from 1 to 5 grains or more as a medicine; from a half to a full teaspoonful in a wine-glassful of warm water as an emetic.

26. *Quinine* (*Quininæ Sulphas*).—A white feathery powder. Its chief use on board ship is as a remedy in cases of ague and other forms of malarial fever. As it is practically insoluble in water, it is usually given as a powder. Its dose as a tonic is from 1 to 5 grains, but in cases of "fever and ague" it is usually given in larger quantities (from 10 to 20 grains). It often causes sickness, headache, and deafness. (See Chapter xxx.).

27. *Salicylate of Soda* (*Sodii Salicylas*).—This salt has a

* The French preparation of paregoric contains twice this strength of opium.

sweetish taste. It is a safe and useful medicine (1) in cases of high fever, when the temperature of the body remains for some hours at 103° or 104°, and (2) in cases of rheumatic fever, in which it is very valuable, and almost indispensable. It is beneficial also in cases of dengue fever. Dose from 5 to 20 grains.

28. Spirit of Chloroform (*Spiritus Chloroformi*) relieves pain and flatulence in the stomach, but is generally used to sweeten mixtures, and to cover the taste of many nauseous drugs. Dose from 10 to 30 drops.

29. Sulphate of Zinc (*Zinci Sulphas*).—Commonly known as “white vitriol.” Minute clear crystals, having a strong “coppery” or metallic taste. Used as an emetic in poisoning cases, in which from half a dram to 1 dram is given in half a tumbler of warm water.

30. Sulphur (*Sublimed*).—When given with treacle or milk acts as a gentle aperient, and is much used in cases of piles. Dose 1 teaspoonful.

31. Sweet Spirits of Nitre (*Spiritus Ætheris Nitrosi*) is useful in cases of palpitation, of flatulence, of bad cold with fever, and, as it acts on the kidneys, is often given in dropsy. Dose half a dram to 2 drams.

32. Tartaric Acid (*Acidum Tartaricum*). (See Bicarbonate of Potash, No. 3.)

33. Tincture of Steel (*Tinctura Ferri Perchloridi*).—A light brown fluid with a strong taste of iron. It is a very useful tonic or strengthening remedy in cases of debility from fever, bleeding, or exhausting disease, of poorness of the blood, and of gleet. It should be given at first in small doses, as it is apt to irritate the stomach and cause sharp pain and sickness. It blackens the tongue and also the stools. Dose from 5 to 20 drops in 1 ounce of distilled water.

EXTERNAL APPLICATIONS.

1. Alum.—Large, clear, and colourless crystals, soluble in water. Useful as a gargle in relaxed throat (1 dram to a pint of cold water), and also as an eye lotion in cases of sore eyes, in which there is much inflammation with running of thick “matter.” When sucked in small pieces alum is beneficial in salivation, and may check bleeding from the tongue or gums. It will act as an emetic if a teaspoonful of the powdered crystal be given in treacle.

2. Black Wash.—Made up of calomel (3 grains) and lime

water (1 ounce). This is used as an application to chancres on the privates. A little of the fluid should be poured into a saucer or gallipot, and a small piece of lint or cotton wool should be smeared with the black powder, which settles in the course of a few minutes.

3. **Blistering Fluid** (*Liquor Epispasticus*)—A greenish-brown fluid used for producing a blister. It should be applied with a camel-hair brush, care being taken that none of it runs down beyond the part that has to be blistered. The stock of this fluid should be frequently renewed as it is liable, when kept for some time, to become too strong and to cause much pain when applied. (See *Blisters*, Chapter xxxi.).

4. **Carbolic Acid** is a powerful antiseptic, and very valuable for cleansing and dressing wounds, when mixed with water in the proportions of 1 ounce of the acid to $1\frac{1}{2}$ pints or 2 pints of water. The latter strength of solution will be found to answer all ordinary purposes. Care should be taken in making the solution, as carbolic acid is a strong caustic, and will, when spilt on the fingers, burn the skin.

5. **Carron Oil**.—This excellent application to burns and scalds is usually composed of equal parts of lime water and linseed oil, but a good substitute is supplied in the Lime Liniment of the British Pharmacopœia, which is composed of lime water and olive oil. Each application is a thick creamy fluid, which should be thickly spread on linen.

6. **Caustic** (*Argenti Nitras*).—Supplied in small white sticks, which are wrapped in dark coloured paper. It is used for keeping down proud flesh; and, when mixed with water, as a lotion for inflamed eyes. It is a strong and painful agent, and it would be well not to use it unless it be recommended with necessary instructions by a medical man.

7. **Creosote** is useful, not only as an internal remedy, but also as a gargle for sore throat, or a wash for the mouth in salivation ($\frac{1}{2}$ dram to a pint of water). One drop applied on cotton wool to a hollow tooth will often stop, or much relieve, toothache.

8. **Friar's Balsam** (*Tinctura Benzoini Composita*).—This, when applied by means of lint or cotton wool thoroughly saturated with the liquid, forms a very good antiseptic dressing to fresh wounds, and a stimulating and cleansing dressing to foul sores and old wounds.

9. **Goulard's Extract** (*Liquor Plumbi Subacetatis*).—A transparent colourless liquid, which, when added to hard water, gives it a milky appearance. When added to soft or distilled water

(1 dram to half a pint) it forms lead lotion, a useful application to swollen and inflamed parts, as bruises, sprains, fractures, and "swelled testicle." If any of it be swallowed accidentally a large dose of Epsom salts should be taken immediately. (See Chapter xxx.).

10. **Strong Solution of Iodine** (*Liquor Iodi Fortis*).—Useful for inhalation (2 or 3 drops to $\frac{1}{2}$ pint of steaming water) in cases of sloughing throat (syphilis and diphtheria), and also in chronic and troublesome cough. The solution is often applied by means of a small mop of sponge to rheumatic joints, and over enlarged glands in the neck and groin.

11. **Iodoform**.—A yellow crystalline powder used as an application to soft chancres, to open buboes, and to foul sores. It is very beneficial also as an antiseptic dressing to fresh wounds. There is no kind of wound or open sore to which it may not be applied. It is a good cleansing agent, relieves pain, and promotes healing. It may be applied either by using the prepared dressings known as iodoform gauze and iodoform wool, or by putting some of the powder in an ointment or pill box, the top of which is covered by muslin, and by "dusting" it over the raw surface.

12. **Linseed Meal**.—Used for making poultices. (See p. 286.)

13. **Mustard Leaves**.—This is a convenient form of producing redness and irritation of the skin, the action being more intense than that of an ordinary poultice or fomentation, and less severe, on the other hand, than that of a blister. The leaf should be dipped in hot water and then applied over the seat of mischief. It should be allowed to remain. This application will be found useful in cases of pleurisy (see p. 96), and a leaf placed over the breast bone, just below the throat, will often give much relief to a bad cold with cough and huskiness.

14. **Olive Oil**.—Used in enemata, as a dressing for slight burns and scalds, and for smearing catheters before they are used. It is also useful in cases of poisoning by carbolic acid and caustic potash and soda.

15. **Opodeldoc** (*Linimentum Opii*).—A black fluid containing a large proportion of opium; may be found beneficial if gently rubbed over the skin in cases of lumbago and other "muscular" pains.

16. **Turpentine Liniment** (*Linimentum Terebinthinæ*) is a white and thick fluid with the smell of furniture polish. It is most useful in cases of old injury and when a joint long remains stiff and painful after a sprain or fracture.

OINTMENTS.

17. *Boric Acid (Unguentum Acidi Borici)*.—A very useful application to superficial wounds, slight burns and scalds, and all kinds of sores.

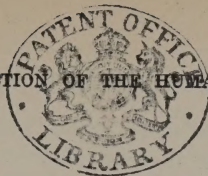
18. *Ointment of Galls and Opium (Unguentum Gallæ cum Opio)*.—A brown ointment which often gives much relief when applied every three or four hours to swollen and painful piles.

19. *Mercurial Ointment (Unguentum Hydrargyri)*.—This is a lead-coloured ointment which may be used to destroy body-lice, which, however, may be effectually dealt with by other means. It should be applied with caution as it is apt to produce itching, and might, *if used too freely, cause salivation*.

20. *Sulphur Ointment (Unguentum Sulphuris)*.—A yellow ointment, useful when rubbed over the whole surface of the body in cases of itch. It often causes an irritating rash which may be removed by a glue bath.

21. *White Precipitate Ointment (Unguentum Hydrargyri Ammoniaci)*.—Useful for the removal of body-lice (see p. 240).

22. *Vaseline*.—This useful application serves very well the objects of simple ointment, for which it has been substituted, and, unlike the latter, will remain for a long time unchanged by hot weather. It will be found useful for application to all small wounds and superficial sores, to which it should be applied on lint or linen. It gives much relief when smeared over inflamed and dry skin, and may be used in erysipelas of the face. It is often applied to the face in cases of smallpox with the view of preventing pitting. It may be used instead of oil for smearing a catheter before it is passed into the urethra.



CHAPTER IV.

CONSTRUCTION OF THE HUMAN BODY.

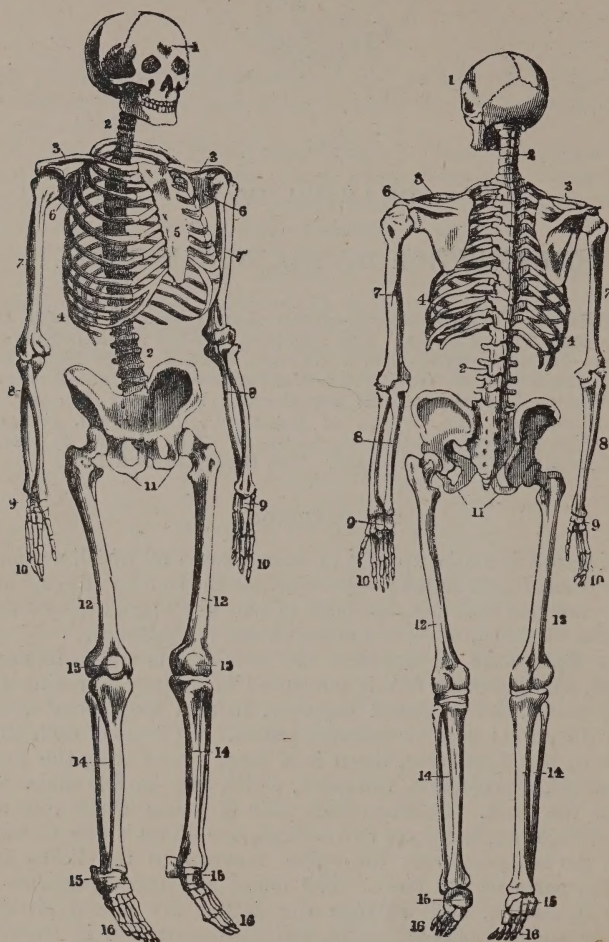
The Skeleton:—THE BACKBONE—HEAD—CHEST—PELVIS—LIMBS AND JOINTS. **The Muscles.** **The Nervous System:**—BRAIN—SPINAL CORD—NERVES—SYMPATHETIC NERVOUS SYSTEM. **The Heart and the Circulation of the Blood:**—VENTRICLES—AURICLES—ARTERIES—VEINS—THE BLOOD AND ITS CIRCULATION—THE LUNGS AND RESPIRATION. **The Organs of Digestion:**—INTESTINAL CANAL—PANCREAS—LIVER—DIGESTION—LACTEALS. **The Organs of Excretion:**—KIDNEYS—LIVER—SKIN. **The Structure of a Limb.**

THE SKELETON.

THE skeleton is made up of 214 bones, some of which are *long*, as the bones of the limbs; some *short*, as those of the fingers and toes; some *flat* and *thin*, as those of the skull; and others very irregular in shape, those of the backbone, for instance.

The Backbone or Spine.—The backbone is not, as its name implies, a single bone, but is composed of twenty-four ring-like bones, which, when placed together, form a long canal along which the spinal cord or marrow passes. In front of each ring, except in the first bone, there is a large round disc, the *body*, and behind, a projection, the *spine*, which can be felt under the skin of the back. Between each pair of bones, when they are applied together, there are two orifices, one on each side, through which nerves pass from the spinal marrow to the limbs and different parts of the body. The bones are bound together by tough ligaments, and between the bodies are placed circular discs or pads of elastic gristle, which prevent jars in walking and jumping, and allow the body to be bent forwards and turned from side to side. Of the twenty-four bones, seven belong to the neck, twelve to the chest, and five to the loins.

The upper end of the backbone supports the skull, and to its lower end is attached the pelvis. To the twelve bones in the back are attached the ribs, twelve on each side.



Front View.

Back View

Fig. 2. — Skeleton.

- | | | |
|--------------|-----------------------|-----------------------|
| 1. Skull. | 7. Humerus. | 12. Femur. |
| 2. Spine. | 8. Radius and Ulna. | 13. Patella. |
| 3. Clavicle. | 9. Carpal bone. | 14. Tibia and Fibula. |
| 4. Ribs. | 10. Metacarpal bones. | 15. Tarsal bones. |
| 5. Sternum. | 11. Pelvis. | 16. Metatarsal bones. |
| 6. Scapula. | | |

The Head.—The skull, which contains the brain and four of the organs of special sensation (ears, eyes, nose, mouth), is composed of twenty-three bones. The lower jaw is freely movable, but the other bones in grown-up persons are soldered together, and form at the top and sides of the head a solid box of very hard bone. In the face the bones, which are lighter and thinner, are protected against injury by the projection of the cheek bones. The under surface of the skull is perforated by num-

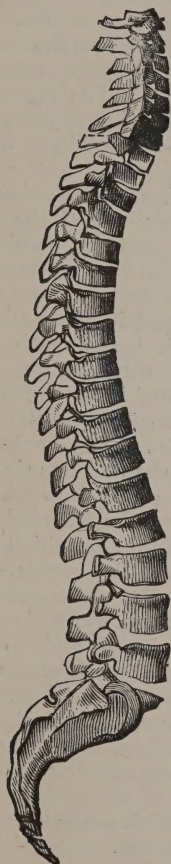


Fig. 3.—Spine.

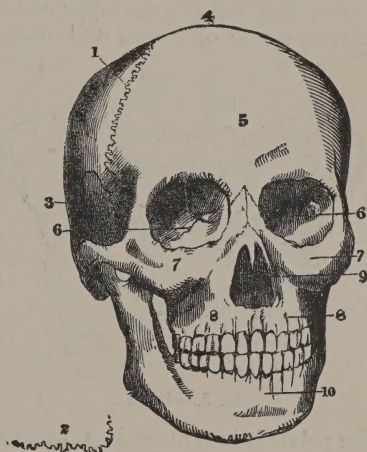


Fig. 4.—Skull.

1. Coronal suture.
2. Suture.
3. Temporal bone.
4. Vertex.
5. Frontal bone.
6. Eye sockets.
7. Cheek bone.
8. Upper jawbone.
9. Nasal cavity.
10. Lower jawbone.

erous holes, one very large and oval in form for the passage of the spinal marrows; the others, which are much smaller, for the passage of nerves from the brain, and of blood-vessels, which run in a reverse direction, to supply this organ.

The Chest.—This is made up of the spine behind, a flat and narrow bone called the breast bone in front, and twelve ribs on either side. Between each of the first ten ribs and the breast bone there runs a flattened piece of cartilage called the costal cartilage. The tops of the last two ribs are quite free in front, and are not connected in any way with the breast bone. The cavity of the chest is filled in below by a large flat muscle called the midriff (diaphragm), which separates the organs of the chest from those of the belly or abdomen. The upper end of the chest, which is much smaller than the lower part, communicates freely with the neck. The organs contained within the chest are the two lungs and the heart.

The Pelvis.—To the lower end of the spine is attached a large uneven girdle of strong and massive bones ; behind the rump

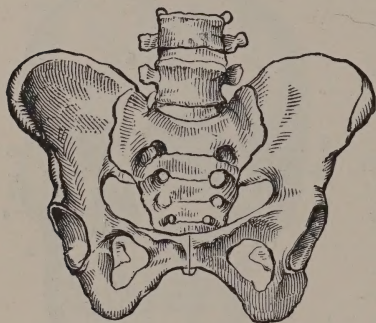


Fig. 5.—Pelvis.

bone (sacrum), which is really a continuation and part of the spine, and at the sides and in front the two haunch bones, each made up of three bones, easily separated in the infant, but fused together in the adult. On the front and outer part of each haunch bone is a deep round cavity into which is received the rounded upper end of the long thigh bone.

The Abdomen.—Between the chest above and

the pelvis below there is a large cavity called the abdomen or belly. Whilst the skull is a compact case of bone, and the chest a cage composed of bars of bone (the ribs), the walls of the belly consist in front and at the sides merely of skin and flesh, the only bony support and protection being the spine behind. This large cavity contains the stomach and intestines, the liver on the right side, the spleen on the left, the pancreas running across the spine, the two kidneys, one on either side of the spine, and low down in the pelvis the single bladder, in which the urine collects after it has been filtered away from the kidneys.

The Limbs.—The upper part of the chest is further protected by two bones ; one long and narrow—the collar bone (clavicle)—which passes in front between the top of the breast bone and the tip of the shoulder ; the other, a flat triangular bone—the shoulder blade or scapula—which covers the chest behind. These

two bones are joined together at the shoulder, the collar bone forming a kind of stay or boom, and suspending the upper limb, the skeleton of which consists of one bone for the upper arm, between the shoulder and the elbow; two bones for the forearm, between the elbow and the wrist; and a number of small bones (27) for the hand and fingers. A somewhat similar arrangement is met with in the lower limb, in which will be found one thigh bone, two leg bones, and twenty-six bones in the foot and toes. There is in front of the knee a detached flat bone, the knee-cap (patella).

Joints.—The bones are joined together by bands and cords of tough and flexible material: *ligaments*; where two bones come together and are thus connected, a joint is formed. In some joints the junction is so close that a very slight play of movement is permitted. In others there is more or less movement in certain directions, as in the elbow and knee, in which the forearm or leg can be moved forwards and backwards, but not from side to side; whilst at the hip, and still more freely at the shoulder, the limb can be bent and twisted in every direction. The ends of the bones, which form a movable joint, are each covered by a layer of smooth white cartilage or gristle, and are enclosed, not only by the ligaments, but also by a bag of thin membrane, from the inner or joint surface of which exudes in small quantity a clear sticky fluid, the *synovial fluid*, or joint oil.

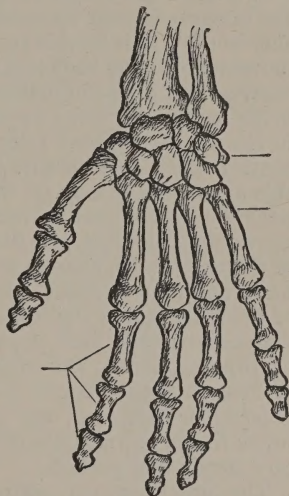


Fig. 6.—Skeleton of hand.

THE MUSCLES.

The different parts of the skeleton are supported and moved on one another by masses of firm red flesh called muscular structure. The flesh, which forms a large proportion of the body, and gives to its different parts their well-known shapes, is made up of distinct muscles, some long and thick, like the biceps in front of the arm; others broad and expanded, like the deltoid muscle over the shoulder, and the muscles of the buttock.

Many of the muscles, particularly those of the limbs, are composed partly of muscular structure or flesh, and partly of long and white cords or bands, which are called *tendons* or *sineus*. When a muscle contracts it becomes thicker and shorter, and moves the bone, or bones, to which it is attached. This may be well seen in the biceps of a strong and muscular man, which, as the forearm is bent forwards at the elbow, becomes swollen and shortened. It is by this contraction of muscles that the different movements of the body and limbs are effected. As a rule, muscles contract under the influence of the will, the message or stimulus being carried from the brain to each muscle by its own nerve, in the same way that telegraphic messages can be sent from a central office to different parts by different wires. In disease this arrangement may be disturbed. If the brain be disordered irregular and violent movements of the muscles, such as occur in convulsions and epileptic fits, may be excited quite independently of the will ; or, in consequence of the communication between the brain and certain muscles being cut off through disease or injury of the intervening nerves, complete loss of motion or paralysis may occur in the limb or part of the body to which the diseased or injured nerves are supplied. For instance, if, as usually results when the back is broken, the cord or spinal marrow be crushed or squeezed, the patient will be unable to move the lower limbs, the muscles of which, from the hips to the toes, are now torpid and palsied.

The muscles which contract just when one wishes them to do so, and are under the control of the will, are called *voluntary muscles*. There are, on the other hand, some few muscles in the body over which the will has no influence. Of these, which are called *involuntary muscles*, the most important are those of the heart, which never cease to work night and day during the life of every individual.

THE NERVOUS SYSTEM.

This system is composed of the brain, the spinal cord or marrow, and the nerves.

The **Brain** is enclosed by the skull, and covered by three membranes, the outer one of which is closely attached to the inner surfaces of the skull bones, and is so thick and tough as to afford much protection when a portion of bone has been removed by injury or disease. This membrane is called the *dura-mater*. The brain structure is grey on its surface and white in the interior. The surface of the organ in the human being

is not smooth, but is marked in every part by tortuous folds (*convolutions*) which are separated from one another by deep furrows. These folds follow much the same arrangement in different individuals, and though very complicated have of late years been mapped out and divided into distinct regions. The lower surface of the brain, which is very uneven, sends off a number of white cords (*nerves*) which pass through small openings in the base of the skull. Most of these are distributed to the organs of smelling, seeing, hearing, and taste.

Concealed under the back part of the brain is a smaller and distinct organ of nerve structure marked on its surface by small transverse furrows. This organ, which is placed between the chief mass of the brain above and the spinal cord below, is called the *cerebellum* or little brain. The average proportion of the weight of the brain to the weight of the whole body is about 1 to 40. In the descending scale of living creatures, the differences between the weights of body and brain become more striking.

The Spinal Cord or Marrow.—This, like the brain, is composed of soft nerve structure, and is enclosed within membranes. It begins just below the little brain and extends along the canal formed by the bones of the spinal

column to the region between the back of the chest and the loins. It gives off on each side thirty-one pairs of nerves, one nerve of each pair being in front of the other. The nerves in front, or *anterior roots* as they are called, are

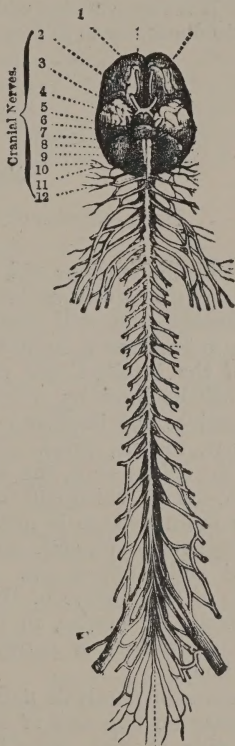


Fig. 7.
Brain and Spinal Cord.

motor nerves, and preside over the contraction of muscles and the movements of the body, whilst those behind, the *posterior roots*, are *sensory* nerves and the tracts along which sensations are carried to the brain. The two roots soon join and form single nerves, which pass through the openings ranged along the sides of the spinal column.

The Nerves are long white cords which pass from the brain and spinal marrow to different parts of the body. The large nerves



Fig. 8.—Section of Cord—*a*. Anterior Nerve-root.

formed by the anterior and posterior roots of the spinal marrow break up into numerous branches, each of which again divides into smaller and still smaller branches, till every organ and structure receives a supply of thin threads. The brain is the seat of the intellect and consciousness, and the centre which sends off the force by which muscular movements are affected, and receives the impressions made on the organs of sensation (eye, ear, tongue, skin). The motor impulse which is carried along the spinal cord, the anterior roots of the spinal marrow, and the nerves which end in muscles is generated at the surface of the brain and, as is now generally believed, in a somewhat restricted region on each side of this organ, which may be closely defined and mapped out. Whilst disturbance of the larger portion of the surface of the brain may not interfere with the movements of muscles, an injury to this motor region will cause either convulsions or paralysis of one or both limbs on one side of the body.

In cases of paralysis and loss of sensation caused by injury or disease on one side of the brain, the opposite, and not the same, side of the body is affected. Thus, in an attack of apoplexy if the left arm and left leg be useless and paralysed, it may be concluded that the right side, not the left, of the brain is diseased. In cases of severe head-injury also, if the bone be broken and driven into the brain on one side, the same side of the body may remain unaffected, whilst the patient is unable to move the opposite arm and leg. This is due to the anatomical fact that the nerves from opposite sides of the brain cross

one another before they are distributed to the different parts of the body. The crossing of the motor nerves takes place at the upper end of the spinal marrow near the little brain, that of the sensory nerves in the brain itself and along the spinal marrow.

Sympathetic Nervous System.—In connection with the heart, lungs, and other organs which are beyond the control of the will, there is a system of small masses of nerve structure—nerve centres or very minute brains—which are connected together by nerve threads, and send off, each to its special organ, an abundant nervous supply. It is by this system that the regular and continuous action of certain most important functions (the circulation of the blood, breathing &c.) is maintained during life.

THE HEART AND THE CIRCULATION OF THE BLOOD.

The heart, which is situated in the chest between the two lungs, with its upper and broad end behind the upper part of the breast bone, and its lower and pointed end behind the ribs on the left side, is a hollow organ, with red and fleshy walls made up of muscle. It contains four cavities, two on either side. The lower and larger cavities are called the *ventricles*, and the upper cavities the *auricles*. The auricle on each side communicates with the corresponding ventricle, so that fluid can pass from one to the other; but between the two cavities on the right and those on the left side there is a muscular partition.

The openings between the auricles and ventricles are furnished with valves, which allow a fluid to pass from the former to the latter, but prevent it from flowing in a reverse direction. In the living subject the heart is in constant action, contracting and expanding alternately from sixty to eighty times in the minute.

Connected with the heart, and opening into each of its cavities, are several large blood-vessels, the most important of which is a large artery called the *aorta*, which communicates with the left ventricle, and a large vein—the *vena cava*—which opens into the auricle on the right side.

The aorta is the trunk of a branching system of blood-vessels or tubes, called *arteries*, which carry red blood from the heart to all organs and structures of the body. The vena cava is formed by the union of an immense number of vessels called *veins*, by which the blood, after it has given up nourishment to these different parts, is carried back to the right side of the heart.

The arteries have thick walls; during life the larger branches

may be felt to beat or pulsate under the finger, and, when cut or divided, send out forcible and intermittent jets of *bright red blood*.

The veins have thin and collapsible walls, do not pulsate, and, when wounded, give exit to a slow and steady stream of purple or *black blood*.

Between the smallest and final branches of the arteries and

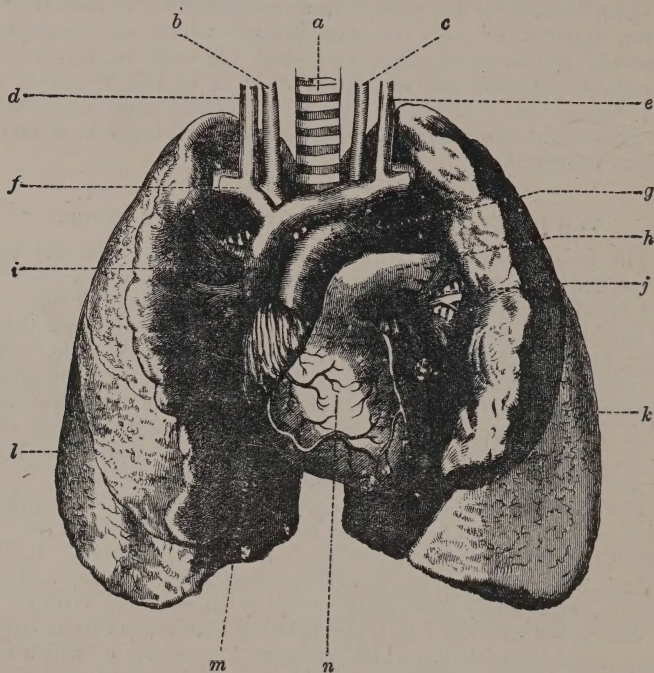


Fig. 9.—Heart and Lungs.

- | | |
|---------------------------|-------------------------------|
| a, Trachea. | h, Pulmonary artery. |
| b, Right carotid artery. | i, Superior vena cava. |
| c, Left carotid artery. | j, Bronchi and blood-vessels. |
| d, Right jugular vein. | k, Left lung. |
| e, Left jugular vein. | l, Third lobe of right lung. |
| f, Right subclavian vein. | m, Right auricle. |
| g, Arch of aorta. | n, Right ventricle. |

the commencing branches of the veins, there are interposed very close networks of extremely minute tubes called *capillaries*.

In consequence of this arrangement, it is difficult to place a pin's point on any living part of the body which is not traversed by blood.

The Blood is a thick and warm fluid, which, after it has been shed, separates into a soft red jelly—the *clot*—and, over this, a layer of thin and clear fluid. If a drop of blood be put under the microscope it will present a great number of very minute red discs ($\frac{1}{3000}$ to $\frac{1}{5000}$ of an inch in diameter) which, in a short time, run together and form interlacing columns. When it leaves the left side of the heart and is supplied to the different organs, it is of a bright red colour, resembling that of red sealing wax. After it is charged with the products of the wear and tear of the structures, and is on its way back to the right side of the heart, it is almost black. The red colour is due to the presence of life-maintaining oxygen, and the black colour to that of poisonous carbonic acid gas (carbon dioxide).

The Circulation of the Blood.—

The heart, with its four chambers and strong muscular walls, acts as a force pump. The blood is received into the auricles and driven out by the ventricles. By contraction of the thick and strong walls of the *left* ventricle, it is forced into the aorta, and through all the arteries and their numerous branches to every organ and structure of the body. It then passes through the minute capillaries, and after it has given up part of its oxygen and become black, through the presence of carbonic acid gas, it passes slowly through the veins, from small to large branches, till at last it is discharged by a single large vein (the *vena cava*) into the *right auricle* of the heart. From the *right* auricle it passes into the *right* ventricle, by which it is pumped through the lungs, where it is brought into relation with the inspired air, and again becomes red and pure. In this state it passes into the *left* auricle, and from thence into the left ventricle, where it begins again the same course.

The large blood vessel which forms the main trunk of all the arteries—the *aorta*—forms, at its commencement, an arch across the front of the spine. From this, which is called the *arch of the aorta*, large branches (carotid and subclavian arteries) are sent off for the supply of blood to the head and neck and the upper limbs. The aorta then descends along the front of the spine, through the chest and belly, giving off large branches on



Fig. 10.
Blood Corpuscles.

either side to all the organs contained in these two cavities, and at last, just below and a little to the left of the level of the navel, divides into two large branches (iliac arteries) by which the blood is carried to the lower limbs. This large vessel, as it passes through the chest, is called the *thoracic aorta*, and after it has descended through an opening in the midriff or diaphragm into the belly, the *abdominal aorta*.

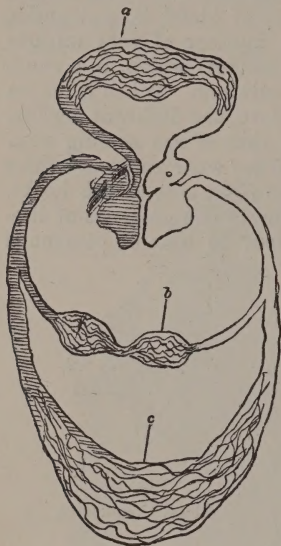


Fig. 11.—Circulation of the Blood.

The largest branches of the abdominal aorta are those supplied to the stomach and bowels. After the blood has passed through these organs, it is collected by a large vein (*portal vein*), which carries it, not directly to the right side of the heart, but through the liver, where it divides into a number of small branches. The blood, after it has traversed the liver, is again collected by branches of a large vein (*hepatic vein*), and finally carried to the right auricle. This is called the *portal circulation*.

THE LUNGS AND RESPIRATION.

The lungs are two soft and spongy organs, which swell to three or four times their bulk when blown up with air, and collapse at once when the air is let out. The lung which fills the right side of the chest is divided by deep clefts into three lobes, whilst the smaller lung on the left side has only two. The lung structure resembles very much that of a sponge, each organ containing in every part small rounded cavities, which communicate with the final and smallest branches of the windpipe (*trachea*). On the thin walls of these cavities is spread out a very fine network of capillary blood-vessels.

The windpipe (*trachea*) is a long tube which, commencing below the back of the tongue, descends in front of the neck and behind the breast bone, where it divides into tubes (*bronchi*), one for the right, the other for the left, lung. These bronchi also divide and subdivide, like the branches of a tree, into a number of small twigs which, as has been stated above, open into the small cells of the lungs.

When the two cavities of the chest in which the lungs are suspended expand, in consequence of the upward movement of the ribs, and of the descent of the diaphragm or midriff, the elastic lungs also expand and become distended by air, which passes from the mouth and nose, through the windpipe and its branches. Then, as the ribs fall back and the diaphragm ascends, the lungs are again compressed, and the air is driven out. (Fig. 13).

During these movements, which are regularly repeated from fourteen to twenty times in the minute, important changes are effected, on the one hand, in the inspired air, and, on the other, in the blood which circulates through the lungs in its course from the right to the left side of the heart. The expired or returned air has not only lost some of its oxygen, but is loaded with the waste products of the living tissues, and contains an increased quantity of the very poisonous gas known as carbonic acid gas or carbon dioxide. The blood which as it left the right side of the heart

was impure, and blackened by this gas, gives off this and other poisonous ingredients, takes up oxygen, and by the time it reaches the left side of the heart has again become red and pure.

If through any failure in the mechanism of breathing, or through impurity of the external air, the blood, when it has reached the lungs, cannot get rid of its carbonic acid, it becomes poisonous, and soon ceases to circulate. This is the condition known as *asphyxia*, which occurs in drowning, suffocation, and the breathing of air laden with choke-damp, or the vapour from lime kilns and burning charcoal. Either fresh air cannot reach the blood

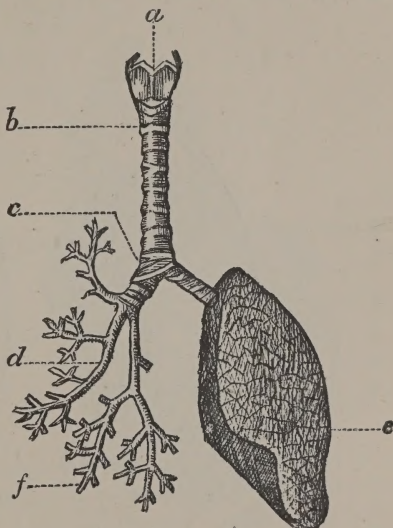


Fig. 12.—Structure of Lung.

- a, Larynx.
- b, Trachea.
- c, Right bronchus.
- d, Bronchial tubes.
- e, Left lung.
- f, Ultimate bronchial tubes.

and remove its carbonic acid gas, or the air itself contains so large a proportion of this poisonous agent that it is incapable of receiving any more.

As with every breath the inspired air is deprived of some of its oxygen, and rendered impure by the addition of carbonic acid

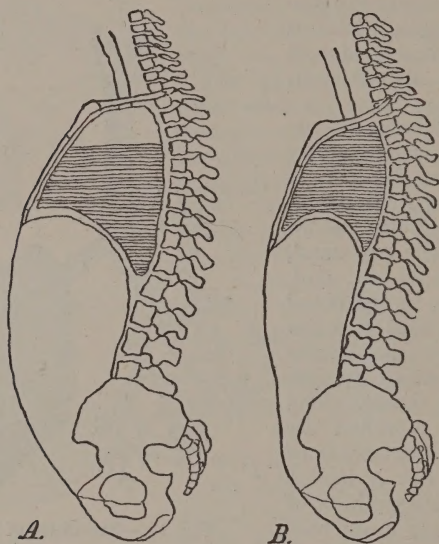


Fig. 13.—Diagram of Respiration.—*A*, Expansion of Chest in Inspiration; *B*, Contraction of Chest in Expiration (*after Huxley*).

gas, it will be evident that, unless the supply of air for breathing purposes be renewed from time to time, it will become so charged with the latter gas as to prove more or less injurious, and to act as a poison. Hence the danger of overcrowding, and of neglect in ensuring proper ventilation of any small space occupied by a number of persons.

THE ORGANS OF DIGESTION.

The food, after it has been crushed and minced by the teeth and mixed with the spittle or saliva, is, in the act of swallowing, pressed down the gullet or œsophagus, a muscular tube which

passes along the neck in front of the spine and behind the wind-pipe. It then reaches the stomach, a large muscular bag capable of considerable dilatation which is placed in the upper part of the belly on the left side. By the contraction of the stomach the food is next forced into the upper part of a very long and coiled tube called the *intestinal canal* (the bowels). This tube, which is about 30 feet in length, is divided into two portions, the *small* and the *large intestine*. The *small intestine*, which occupies most of the belly, begins at the right end of the stomach, and, after much twisting, passes near the right groin into a wide pouch of gut which is called the *cæcum*. This is the beginning of the *large intestine* formed for the most part by the *colon*, which ascends along the back of the belly on the right side, crosses over to the left side, and then descends to the left groin, where, after forming a peculiar twist or curvature called the *sigmoid flexure*, it runs into the *rectum*. This, which is the last portion of the bowels, takes a short and almost straight course to the external opening or *anus*. There are marked differences between the small and the large intestines. In the former the coats are thinner, and the tube is regular and of the same width in every part, whilst in the latter the coats are thicker and more muscular, and the

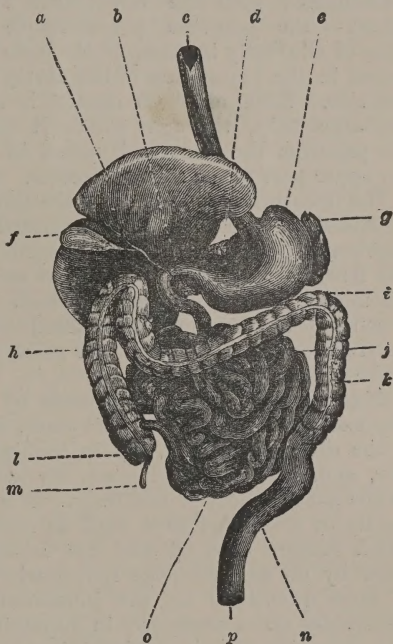


Fig. 14.

- a. Liver.
- b. Pylorus.
- c. Oesophagus.
- d. Pancreas.
- e. Stomach.
- f. Gall-bladder.
- g. Spleen.
- h. Large Intestine (Ascending Colon).
- i. Transverse Colon.

- j. Jejunum (Small Intestine).
- k. Descending Colon.
- l. Cæcum.
- m. Vermiform appendix.
- n. Sigmoid Flexure of Colon.
- o. Ileum (Small Intestine).
- p. Rectum.

tube is formed by a series of pouches separated by distinct constrictions. The walls of both the small and large intestines are made up for the most part by muscular structure, by the contraction of which the food is gradually forced along the intestinal canal.

Connected with the bowels are two large and important organs—the *pancreas* (sweetbread), which runs across the back of the belly in front of the spine, and the *liver*, which is placed in the upper part of the cavity on the right side behind the ribs. Each of these organs is supplied with a duct or discharge tube, through which it pours forth its fluid—in the pancreas the pancreatic juice, in the liver the bile—into the upper part of the small intestine.

The intestines, together with the liver and other solid organs contained in the body, are enclosed in a thin transparent membrane by which they are suspended, as it were, in a large and irregularly shaped bag to the spine, and lower surface of the midriff. This membrane, which is called the *peritoneum*, is continued over the inner surface of the walls of the belly. Its free surface is very smooth so as to permit full movement of the coils of the intestine.

Digestion.—This is the process by which food is converted into material fitted, in the first place, for promoting the growth of the different organs, and in making up for their wear and tear, and, in the second place, for acting as fuel and keeping up the natural heat of the body. The former purpose is served mainly by articles of food, such as meat, eggs, milk, cheese, &c., which contain nitrogen and are called nitrogenous foods; the latter by oil and fat—the hydrocarbons—which are consumed in large quantities by the inhabitants of very cold regions. Vegetables assist materially in supplying the blood with nutritive material and in maintaining heat. The bad results of their absence from a dietary is shown by the occurrence of scurvy after abstinence from vegetable food. These articles of food, before they can be taken up by the blood and carried as suitable nutriment to the structures of the body, must be acted upon by different juices or secretions formed in the stomach and other organs of digestion. If any of these organs fail to form its special juice, in consequence either of disease or of overwork, a portion of the food remains so much raw or useless material, and sets up irritation. Hence the trouble and evils of indigestion.

In the mouth the food is divided by the teeth, so that every portion may be exposed to the action of the different juices to

which it has to be subjected. At the same time it is moistened by the saliva, which not only serves to convert the food into a soft mass or bolus that can be readily swallowed, but also changes starch into soluble sugar.

In the stomach the nitrogenous and most nutritious articles of food are acted on, and rendered soluble by the abundant acid juice—the gastric juice—which is poured out from the inner lining of this organ. The food is thus melted down, so that it passes into the intestines in a fluid state.

In the intestines the fluid food is mixed with bile and pancreatic juice, which act on the oil and fat and convert these into an emulsion or thick fluid, in which all the oil globules run together. A large portion of the food so prepared is taken up by the coats of the small intestine, and is carried through a network of very small tubes resembling capillary blood-vessels, which are called *lacteals* or *lymphatics*. It passes from minute to larger tubes, and at last reaches the large tube, called the *thoracic duct*, by which it is poured into one of the large veins of the neck and thus finally reaches the blood. The coarser and useless parts of the food—the waste—are gradually forced on by the contractions of the muscular walls of the intestines, and are finally discharged by the rectum or lower bowel.

THE ORGANS OF EXCRETION.

The blood as it flows through the veins is mixed with numerous waste products, which, if allowed to accumulate, would prove very hurtful to the system. Carbonic acid gas, as has already been pointed out, is discharged by the lungs; but besides this poisonous agent there are others, either fluid or in a state of solution, which need special organs for their removal. These organs, the most important of which are the kidneys, the liver, and the glands of the skin, are called *excretory* organs.

The **Kidneys**, which serve to remove the wasted and used-up tissues formed by nitrogenous matter, are two large and smooth organs situated at the back of the belly, one on either side of the spine. Each kidney is supplied with a long tube (*ureter*), which runs down to the bladder, and serves as a conduit through which urine is slowly and almost constantly discharged into this organ. The bladder itself is a muscular bag, sometimes small and collapsed, and at others much distended, according as it is empty or overladen with urine. The urine, after it has collected in the bladder, is discharged by contraction of the muscular wall of this organ through the urethra, which, in the male, is a curved canal measuring from 7 to 8 inches in length.

The **Liver** assists in removing the products of change and decay in the fatty tissues of the body, by its excretion of bile. This fluid is stored up in a muscular bag (the gall bladder), by which it is discharged from time to time into the upper end of the small intestine, where it shares in the process of digestion,

and co-operates with the pancreatic juice in reducing fatty matter to a coherent and uniform fluid.

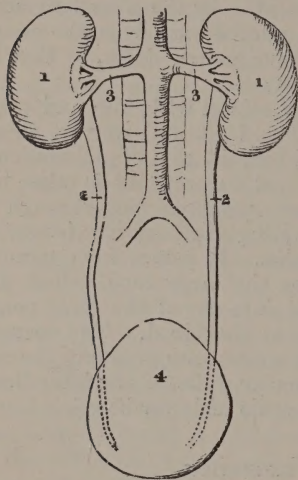


Fig. 15.—Urinary System.—1, Kidneys; 2, Ureters; 3, Blood-vessels; 4, Bladder.

The **Skin**, besides being a soft and elastic covering for the flesh and other soft parts, an organ of sensation, and a means, as it is a bad conductor, of retaining the heat of the body, is also an important excretory organ, as it is capable of throwing off in the course of twenty-four hours almost as much water as the kidneys, together with impure products of tissue decay.

The smooth outer layer of the skin, which, when exposed to friction, becomes thick and hard, as in the palms of manual workers and the soles of those who go "barefooted," is the *epidermis*. Below this is a softer layer, which bleeds when cut—the true skin or *cutis*—in which the finest twigs of the nerves end, and which contain the sweat glands scattered in innumerable quantity over the whole surface of the body. By these minute organs, which can be discerned only by the aid of a microscope, watery vapour is given off, not only now and then, as *visible perspiration*, but by constant and slow evaporation, or *imperceptible perspiration*.

The skin contains other small glands (sebaceous glands), which form fatty matter for softening the epidermis, and in its deeper parts is studded in many parts of the body by the roots or bulbs of hairs. It is only in the upper part of this cutis or true skin that the dark pigment is deposited in coloured men, so that it may be truly said that the colour of a dark skinned person is not skin deep.

STRUCTURE OF A LIMB.

Taking a portion of a limb—the arm for instance—the surface consists of skin (A) made up of two layers—the *epidermis* and the *cutis* or true skin. Beneath this there is a layer of soft white tissue called *cellular tissue* or *superficial fascia* (B), forming a kind of network, the spaces of which communicate freely with one another, so that by the injection of air, as is practised by butchers in blowing up a dead calf, the whole of the body may be distended. This tissue is traversed by large veins, which may be seen under the skin, and is loaded with fat which, in corpulent persons, forms a thick layer, though not so thick as in the walls of the abdomen and in the buttocks. This covers a tough and glistening membrane—the *deep or muscular fascia* (D)—which forms a continuous sheath for the flesh or muscles, and sends down layers to the bone, which form partitions between the muscles in front and those at the back of the limb. The flesh does not form one compact mass, but is made of several distinct muscles (C), which are separated by cellular tissue. Running in this cellular tissue and between the muscles are the large vessels and nerves of the limb (E), each artery being accompanied by one vein in the thigh and in the upper arm, and by two veins in the leg and forearm. In the midst of the mass of muscles is the *bone* (F), which, in the middle of the limb, is a tube containing a reddish or dark-coloured fatty substance called *bone-marrow*.

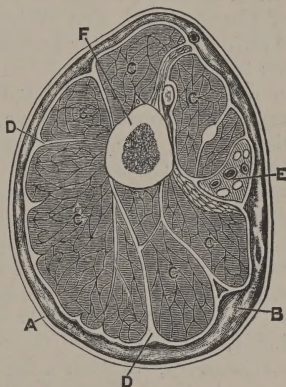
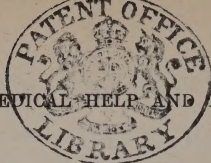


Fig. 16. — Section of Limb.



CHAPTER V.

THE CLINICAL THERMOMETER AND ITS USE.

USE—DESCRIPTION—MODE OF MAKING OBSERVATIONS—TEMPERATURE INDICATIONS.

IN man, as in all warm-blooded animals, the heat of the body, when healthy, varies but very little, whatever may be the heat of the external air. Whether he be in the Tropics or in an Arctic zone, whether exposed on deck or down in the stoke-hold, his temperature, if he be in good health, will be but a few tenths of a degree above or below 98·4° Fahrenheit. In disease, however, this constancy is very often disturbed, the temperature rising four, five, or more degrees in conditions of fever, and falling, though usually to a less extent, in cases of collapse and exhaustion. The variations will be revealed by the clinical thermometer, a valuable, and, indeed, an indispensable, instrument to everyone who may at any time unavoidably incur the responsibility of dealing in the absence of professional control with cases of serious illness. The information it gives is reliable, and may be readily attained. Although there may be a doubt, full advantage of which should always be given to the complainant, whether a man, apparently in good health, can be seriously ill if the heat of his body remains constantly at 98·6°, there can be none at all that he is so if it be above 103°.

The clinical thermometer is a small instrument of glass, which marks degrees of heat between 90 and 112.* From 90° to 110°,

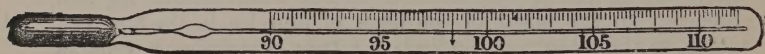


Fig. 17.—Clinical Thermometer.

these two degrees, and every fifth degree between them, is marked on the glass by its corresponding figure, and the spaces between the lines indicating the degrees are each marked by shorter lines, that indicate fifths of a degree. The temperature of a healthy man, or the "normal" point (98·4°), is marked by a small arrow. The instrument is usually "self-registering," a small portion of mercury, separated from the rest of the mercurial column by a bubble of air, remaining at the highest point after this column has fallen. The upper end of this detached portion or *index* marks the temperature.

* In most modern instruments the lower limit of the scale is 95°.

The most suitable locality for taking a man's temperature is the armpit, the skin of which, if moistened by sweat, should be wiped dry. Care must be taken before using the thermometer to shake down the index by a long and quick swing to 97° or some point below this. The bulb of the instrument should be placed well into the armpit and be kept there for at least five minutes by getting the patient to press the elbow to the front of the body. If the temperature, for any reason, cannot be taken in the armpit, the thermometer may be held in the mouth between the lips—not between the teeth. In serious and in doubtful cases it would be well to take the temperature twice in the day—between 6 and 8 a.m. and at 6 p.m., and also to record the observations on a chart.

Temperature Indications.

A temperature below 93° or above 108° is almost always fatal.

A continuous temperature of 97° or lower would indicate extreme weakness and loss of vital power.

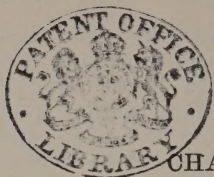
A temperature ranging between 100° and 102° would indicate moderate fever.

A temperature above 103° would indicate high, and, except in cases of ague and remittent, serious fever.

It should be borne in mind that the column of mercury may be accidentally raised to a high point, by rubbing the thermometer with a rough cloth or by placing it near a fire or any heated body—a hot-water bottle or flannel used for fomenting.

As the thermometers sold on the Continent are graduated on the Centigrade scale, the following table, which gives the corresponding degrees of this and the Fahrenheit scale, will be found of service if it be necessary to replace a broken instrument by one purchased abroad.

Fahrenheit.	Centigrade or Celsius.
110	43·33
109	42·8
108	42·2
107	41·7
106	41·1
105	40·6
104	40
103	39·4
102	38·9
101	38·3
100	37·8
Temperature of { 99	37·2
a healthy man. { 98	36·7
97	36·1
96	35·6
95	35



CHAPTER VI.

FEVERS.

FEVERS—GENERAL REMARKS: (1) **Eruptive Fevers:**—SMALL-POX—SCARLET FEVER—MEASLES—TYPHUS FEVER—TYPHOID OR ENTERIC FEVER. (2) **Malarial Fevers:**—INTERMITTENT FEVER OR AGUE—REMITTENT FEVER—(3) MALTA OR MEDITERRANEAN FEVER—(4) YELLOW FEVER—(5) DENGUE FEVER—(6) PLAGUE

THESE affections are characterised by increased temperature of the body (102° to 105° or more), with quick pulse, rapid breathing, and more or less general disturbance.

A continued fever is one that runs a regular course without any well-marked intervals in which the temperature falls to the standard of health. (Typhus and typhoid fevers.)

An intermittent fever is one in which the attacks are short, and occur at regular times after intervals of ordinary health and natural temperature (ague).

In remittent fever there are also regular short attacks of high fever, but the patient during the intervals constantly remains more or less feverish.

An eruptive fever is one in which there is a well-marked and characteristic rash (small-pox, scarlet fever).

Hectic is a form of remittent fever, which occurs in the course of long and weakening diseases, such as consumption, hip-joint disease, and large abscess. The patient suffers towards bed-time from increased heat of the skin, which is preceded by chilliness, and followed by profuse and exhausting sweating.

An infectious fever is commonly regarded as one, the germs or poison of which may be conveyed through the atmosphere, and be taken in with the breath.

A contagious fever is one that is communicated from one person to another through actual contact.

The Incubation Period of a fever is the interval between the time at which it was caught and the first appearance of the regular symptoms.

The crisis is the stage in which the fever suddenly and rapidly subsides after having reached its height.

(1) ERUPTIVE FEVERS.

SMALL-POX (variola) is an acute infectious fever, which may be readily caught by one person from another, or be carried by the clothes of a third person.* It may exist in any climate, and attacks all races of men, but with exceptional frequency and severity the negro.

Course of the Disease.—An ordinary case of small-pox takes the following course:—A stage of fever, which subsides on the third day, and is followed by an eruption of red pimples, which change into watery blebs or vesicles, and afterwards, about the eighth or ninth day, are converted into round yellow boils or pustules; these pustules finally dry up and form brownish and dirty scabs, which, when they fall off, leave little depressions on the skin—the well-known pitting which follows this disease; when the pustules form the fever is again renewed, and the patient passes into the most serious and critical stage of the attack.

In most cases the eruption, during its changes, remains scattered, the pimples, vesicles, and pustules being separate and distinct. In a more severe form, that of *confluent* small-pox they run together, and in the final and pustular stage the whole of the face or of a limb may be covered by a continuous yellow mass.

The mildest form of small-pox is observed in persons who were vaccinated early in life. The fever in these cases is usually slight, and the eruption soon disappears, and causes very little, if any, disfigurement. The most severe cases, which, fortunately, are very rare, are those of so-called malignant small-pox, in which the face and body are dark and congested, and covered by large purple patches and numerous black spots. The eyeballs are blood-shot, and are marked by patches of effused blood resembling those seen in a bad “black eye.” The following points relating to small-pox are important, and should be borne in mind in any suspicious case:—

Symptoms.—In small-pox the incubation period, or the interval between the catching of the disease and the first appearance of the skin eruption, lasts thirteen or fourteen days.

For two days before the eruption becomes visible the patient is feverish, and complains of headache, and of pain in the back and across the loins.

The eruption consists, at first, of red, dry, and rounded pimples, which have a hard feel, like pellets of shot fixed in the skin.

* Small-pox may also be caught from soiled and infected rags, and from clothes which after infection have been put away for a time.

This eruption appears first, and is most abundant on the forehead and face, and about the wrists.

One or more pimples may be seen on the roof of the mouth.

Each pimple, as it changes into a bleb or vesicle, and shows a yellowish head, becomes cupped or pitted at its top.

On the fourth or fifth day after its first appearance the eruption will be scattered over the body and limbs. It will then vary in character in different parts, presenting red pimples where most recent, and pitted vesicles and yellowish pustules on the face and wrists.

Precautions.—If, therefore, a man, either unvaccinated or vaccinated long since, who has slept on shore within a period of three weeks, presents a rash such as has been described, and states that he has quite recently been feverish and out of health, and felt pains in the head and back, a doctor should at once be called in, or if the ship be at sea, the case should be assumed to be one of small-pox, and steps be taken to isolate the patient and disinfect his surroundings.

Treatment.—A patient affected with small-pox requires good nursing rather than medicinal treatment. He should be removed from the rest of the crew, be kept in a cool and darkened berth, and be attended by a man who has had small-pox or been vaccinated within seven years. If the patient become delirious he should not be left for a moment, lest he wander about the deck or throw himself overboard. He should be fed on beef tea, barley water, and, if possible, milk, and be supplied with lemonade, limejuice drink and cold water to relieve thirst. If he is restless at night he should be allowed (about 9 p.m.) a “strong glass” of whisky and warm water. The bowels should be relieved from time to time by a dose of Epsom salts. The eruption on the face and forehead should be frequently smeared over with vaseline or olive oil. It would not be safe to allow the patient to leave his berth until the fourth day after the last scab has fallen off. During this interval he should be well washed with soap and warm water night and morning, and when quite well should take a warm bath containing some carbolic acid, and be supplied with a suit of fresh and clean clothing.

Besides the above precautions, which are very necessary, as small-pox spreads so readily amongst seamen, steps should be taken to disinfect the forecabin or berth previously occupied by the patient, and to destroy by burning, or to throw overboard, after previous disinfection, his clothing and bedding (see **Disinfection**, p. 20). If the case be a fatal one, the body should be covered at once by a sheet saturated with carbolic acid

solution or some other disinfectant fluid, and be buried soon after death.

SCARLET FEVER.—Symptoms.—It begins abruptly, after an incubation period of three or four days, with high fever, flushing of the face, and sore throat. In the course of the following day a diffused rosy rash, or deep blush of the skin may be observed on the neck and chest. This extends to other parts of the body, and on the fourth or fifth day fades away, leaving a rough and scaly surface, from which, in many cases, large flakes of thin and dry skin peel away (desquamation). The patient remains very feverish during the attack, and suffers much from sore throat. The tongue has usually a very characteristic appearance, its surface resembling that of a strawberry.

Scarlet fever seldom attacks grown-up people, and, as a rule, is not a serious affection except in children. Its chief dangers arise after the fever and rash have passed away, and when the patient has apparently recovered, for then, unless he be kept warm and free from draughts, he may suffer from rheumatism, or, worse still, may be affected with kidney disease and dropsy.

Treatment.—In this, as in other kinds of eruptive fever, the patient should be kept on a low and fluid diet (barley water, weak beef-tea, and milk), and be allowed drinks of lemon or lime juice, and sips of iced or cold water.

The soreness of the throat may be relieved by ice-sucking, or by inhaling the vapour of boiling water, and if there be much pain and difficulty in swallowing, poulticing on each side of the neck, just below the angle of the jaw, will do good.

He should be isolated in a cool but not draughty berth, and must not leave his bunk until the healing stage is over, and the skin has become quite smooth. During this stage he should be well washed twice in the day with warm water and carbolic soap, and at night the rough skin should be smeared with vaseline or sweet oil.

The same precautions should be taken in this as in other infectious fevers to prevent spreading of the disease. The berth previously occupied by the patient should be fumigated, his bedding destroyed, and his clothing carefully sewn up in canvas and set apart for thorough and proper disinfection at the next port.

MEASLES.—This malady, like scarlet fever, is not often met with in the adult, and in the absence of children its appearance on board ship need not cause much anxiety.

Symptoms.—It begins about eight or nine days after exposure to infection, with the symptoms of a bad cold in the head, running

at the eyes and nose, headache, sneezing, &c., which, in the course of three or four days, are followed by a mottled rash appearing at first on the neck and chest, and afterwards spreading to other parts of the body. This rash consists of minute red spots, which run together to form horseshoe-shaped patches. These disappear on the fourth or fifth day. The patient is feverish during the attack, and is often much troubled by cough.

Treatment.—It would be advisable not to give any purgative, as there is generally a tendency to diarrhoea in measles. The patient should be kept warm, and fed on beef-tea, broth, and other articles of a light and fluid diet. The chest should be covered by a layer of cotton wool or flannel, and if the cough be troublesome, 5 grains of cough pill (*Pil. Ipecac. c. Scilla*) may be given two or three times in the day.

Precautions.—As the rash of this eruptive fever is not always very distinct, and may be simulated by those of more serious affections, it would be well in every case of supposed measles, to take the same precautions against spreading as have been recommended in scarlet fever and small-pox.

TYPHUS FEVER.—A “low” and very infectious fever, formerly very frequent in ships as a result of filth, overcrowding, and bad and insufficient food, but now a rare disease, and much less frequently met with than typhoid or enteric fever. It is characterised by high fever, nervous disturbance, and extreme prostration. The incubation period lasts about twelve days, the dark spotted rash, which has given typhus the name of “spotted fever,” appears on the fourth or fifth day, and the fever usually subsides on the fifteenth, in some cases on the twenty-first day.

Symptoms.—The attack begins with decided shivering or mere chilliness, with headache, and pains “all over the body.” The patient gets worse day by day, becoming more and more prostrate, and at the end of the first week lying quite helpless on his back, and passing gradually from a state of stupor to one of continuous delirium. The tongue becomes quite dry and black; the skin is dusky, and, over the body, is marked by a distinct rash, resembling at first that of measles, but in the course of two or three days presenting mulberry-coloured or dark lurid spots. The temperature is very high (102° to 104°) and the pulse very rapid. The bowels are in most cases constipated. The scanty stools and urine are passed in bed, or the urine may be retained and collect in large quantity in the bladder. The crisis or “turn for the better,” is marked by a calm and deep sleep, and by a moist, yet warm skin.

Bad Signs.—Typhus is a very fatal disease, and in a bad epidemic carries off about one in three of those attacked. A very rapid feeble and irregular pulse, swollen belly, cough and difficult breathing, and abscesses in different parts of the body, are all very unfavourable signs.

Treatment.—The patient should be isolated and kept in a warm and well-ventilated berth. In typhus, as in typhoid fever, very much depends on the nursing. The bed sheets must be kept clean and smooth, and great care must be taken to prevent bed-sores. If very little urine be passed it should be drawn off every eight or ten hours by a soft catheter. Ice or cold water should be constantly applied to the head, and the body be frequently sponged with cold water. The diet should be a nourishing one, and consist of strong beef-tea, soup, eggs, and milk, and brandy or port wine must be given freely and at frequent intervals. If there be much restlessness, bromide of potassium (half a dram in water) may be given, and if this fail after two or three doses, trial may be made of an opium pill (5 grains), given every evening, or twice in the day. Quinine should also be given in 5 grain doses every three or four hours.

Precautions.—In typhus fever steps should be taken to prevent spreading of the disease, by thorough disinfection of the men's quarters, and of the patient's clothing and bed-linen (see p. 20).

TYPHOID OR ENTERIC FEVER, called also *Gastric or Nervous Fever*, is usually caught on shore.

Cause.—It exists in all parts of the world, and is probably as prevalent in the tropics as in temperate regions. When two or more cases occur on board ship attention should be at once directed to the drinking water, which ought to be boiled before it is used. Its poison, like that of cholera, is not communicated through direct contact of one person with another, but is usually spread by drinking water contaminated by the stools of a patient suffering from the disease. A marked and constant feature of typhoid fever is ulceration of the small intestine, which, in a severe case, may destroy the whole thickness of its coats at one or more points.

This fever follows an incubation stage of about two weeks, and has a long duration, lasting for at least three weeks. It is in most instances a "low" and rapidly exhausting malady, needing most careful nursing, and followed by a long period of convalescence, during which there is a tendency to a return of the disease.

Symptoms.—The following are the chief symptoms of typhoid

fever which come on after a short stage of headache, low spirits, and general uneasiness :—

The patient lies on his back, and rapidly loses flesh and strength. He is restless, and after a time becomes delirious, rambling in his talk. The face is flushed at first, and in the third week becomes dusky. The tongue and mouth at this stage are very dry and dirty.

The belly is slightly swollen, and tender near the right groin, and the surface is dusky and marked by some scattered pink spots, very small, and not unlike flea-bites, but disappearing when pressed by the finger. The motions are loose, in most cases, frequent, and have an offensive smell, and a pale and yellowish colour.

The temperature, if taken morning and night with a clinical thermometer, will indicate at first the real nature of the disease, and afterwards show how far the prospects may be favourable or the reverse. During the first week the temperature gradually rises ; it is much higher at night than in the morning, but both the morning and evening temperatures of each day are higher than those of the preceding day. In the second week the evening temperature remains almost always at about the same high point (102° to 104°), whilst the morning temperature shows a tendency to become lower day by day. From the middle of the third week the evening temperature will also gradually sink.

The duration of an attack of typhoid varies in different cases. A mild attack may not last longer than three weeks, but the usual length is from four to five weeks. The most serious and critical period is the fourth week.

Bad Signs.—The younger the patient the better are the chances of recovery : weak men and drinkers are bad subjects. The following are bad signs in typhoid fever :—A temperature above 105° ; extreme prostration with drowsiness and general trembling ; severe diarrhœa ; much swelling of the belly, with tenderness ; bleeding from the bowel ; rapid breathing, with cough and expectoration of “rusty” or blood-stained phlegm.

Treatment.—In the treatment of typhoid very much depends on careful nursing. The patient should be kept very clean, and be frequently sponged over the face, chest, and arms with warm water. The hair of the head should be cut very close, and the beard or whiskers trimmed. He should be supplied very frequently with small quantities of milk and water, or weak beef tea. Toast and water, or simple cold water, may also be given freely. If the tongue be brown and very dry it should be cleansed from time to time by lime juice and warm water. In

the course of the third and fourth weeks, and earlier, if there be much prostration, some brandy or whisky in cold water may be given every four hours. The patient should not be allowed to sit up in bed, and the stools should be passed into a bed-pan or a large mass of tow or oakum. If the diarrhœa be severe and frequent (ten or more stools in the twenty-four hours) 5 grains of opium pill should be given two or three times in the day. An opium pill should be given every four hours if there be bleeding from the bowel or much pain in the belly. No aperient and no fruit should be given. The attendant must look carefully to the back of the patient, and endeavour, by the help of soft pillows and, if such be available, of an air or water cushion, to prevent bed sores. He must find out whether the patient passes urine or not, as the bladder sometimes becomes much distended, and it is necessary to empty it twice in the day, by passing a soft and well oiled catheter. It is very necessary after apparent recovery to keep the patient for two or three weeks on a fluid, though nutritious, diet, as solid food of any kind may open up the ulcers in the small intestine, and excite a relapse.

Precautions.—All stools passed by the patient should at once be disinfected and thrown overboard, and soiled bed linen should be immersed in a strong disinfecting solution, or in boiling water. The attendant must look carefully to himself, and wash his hands frequently—always after dealing with the stools—in a basin containing carbolic (1 part to 40 of water) or some other disinfecting solution kept constantly in the sick berth.

(2) MALARIAL FEVERS.

These diseases, the best known forms of which are ague and remittent fever, are of common occurrence amongst seamen, and from the constitutional weakness they are apt to produce when severe and frequently repeated, may be classed with the most serious penalties of a visit to hot countries. They are characterised by their intermittency, the attacks of high fever being repeated at regular intervals. The cause of malarial fever is an infective poison derived in most instances, though not in all, from marshy and low-lying ground. This poison is certainly carried by the air, and there are good grounds for believing that it may be also conveyed into the system by water. Though malarial fever may occur in seamen who have remained on board whilst the ship was in a malarious port, it is almost always caught from the shore. "The crew of a vessel, if free from malaria to begin with, may sail in any latitude, and may be

exposed to every vicissitude of weather, without being liable to contract the infection, so long as they do not approach to a malarious shore.”* The affections caused by the poison of malaria prevail over a large extent of the earth’s surface, but are most severe within the tropics. Indeed, there are very few ports in warm climates that are free from them. Some islands (New Caledonia, the Seychelles, the Sandwich group, and the Rodriguez) are at present almost, if not quite, exempt; but along the coasts of the mainland, between 40° N. and 30° S., intermittent and remittent fevers exist in varying degrees of intensity. They are very prevalent and severe along the tropical ports of the east and west coasts of Africa, along the east coast of South America and the gulf region of the United States, in Chinese ports, in the north-western provinces of India, in Bengal, in Bombay, in Chittagong, and in Ceylon. Amongst the few places beyond the Continent of Europe in which there is very little risk of catching any malarial affection, may be mentioned Cape Town, the Australian ports, Aden, and Barbadoes.

INTERMITTENT FEVER OR AGUE.—Symptoms.—This well-known form of malarial fever is marked by regularly repeated fits or paroxysms, each of which consists of three stages—the first, one of shivering, called the *cold* stage; the second, of high fever with headache, called the *hot* stage; and the third, of profuse and exhausting perspiration, called the *sweating* stage. After an interval, during which the patient may seem to be quite well, the three stages are repeated in the same order. The interval varies in different cases. When the fit is repeated about the same hour every day, the ague is called *quotidian*, when on every other day *tertian*, when on the third day *quartan*. The most severe forms of ague and those most frequently met with in the tropics are quotidian. When a healthy subject is first attacked the three stages are well marked, the shivering being very severe and the fever high and distressing, but, as he becomes enfeebled by the action of malarial poisoning and the effects of a hot climate, the cold stage is shortened and the rest of the fit presents signs rather of prostration than of intense feverish disturbance.

In some cases the ordinary symptoms of ague are marked by signs of serious disorder of the brain and heart. The patient may become delirious, convulsed, or quite unconscious; or he may, after the first stage, remain for several hours very cold and blue and almost quite pulseless.

REMITTENT FEVER.—Symptoms.—The attacks of cold

* Davidson, *Hygiene and Diseases of Warm Climates*, p. 130.

heat, and sweating are renewed every day or every other day, as in ague, but during the intervals there is more or less fever, the patient suffering all the time from nausea, headache, and general discomfort. The severity of this form of malarial fever varies very much in different cases. In some it is attended with much vomiting, in others with diarrhœa, and in the most severe cases is marked by symptoms resembling those of typhoid fever or of cholera. In bad cases of remittent, as in those of intermittent, fever, the patient may become delirious and unconscious.

The worst features of malarial fever are its tendency to return, even after long intervals of perfect health, and the occurrence after frequently repeated and severe attacks of a condition of general debility which is called the malarial constitution or malarial cachexia. This condition, which is the cause of very much of the bad health due to a prolonged stay in hot countries, and renders any other diseases and any wound or injury more serious than they would be in a colder climate, is characterised by irregular and exhausting attacks of fever, loss of flesh, pallor, dropsy, diarrhœa, and a tendency to bleeding either from the gums, nose, mouth, and internal organs, or from any wound however slight. In this form of malarial disease the internal organs, especially the liver, kidneys, and spleen, are seriously affected.

Prevention.—Fleet-Surgeon Coppinger, R.N.,* states that “when ships are obliged to anchor off a malarial shore, the preventive measures to be taken are—(1) to anchor, if possible, to windward of the malarial focus; (2) to anchor a long distance (at least a mile) from the shore; (3) to avoid land-locked harbours; (4) to anchor so that a belt of trees or a hill may be interposed between the ship and the infective area; (5) to avoid the use of shore water, unless it has been boiled; (6) not to allow the crew to remain on shore after sunset.”

Those who are obliged for a time to perform duties on shore should observe the following precautions:—(1) To use only boiled water for drinking, and whilst avoiding excess both in food and drink, always to take a fair meal, with tea or coffee, before beginning the day's work; (2) to avoid exposure to chill or mist at night, and never to sleep in the open air; (3) to change the clothes immediately after work, and to avoid a chill; (4) to take 4 or 5 grains of quinine morning and night, either in powder or in tabloids.

Treatment.—In the cold stage of a severe ague fit the patient should be covered by thick blankets, and take some warm tea or

* Davidson's *Hygiene and Diseases of Warm Climates*, p. 108.

milk. As the hot stage comes on the coverings should be gradually removed, the surface of the body sponged with vinegar and water, and if there be severe headache, ice, or cloths dipped in cold water, may be applied to the forehead. During the sweating stage the patient should be allowed to rest undisturbed. In the intervals between the ague fits quinine should be given. The best way of administering this remedy is to make the patient take 10 grains about half an hour before the fit is expected, and 5 grains soon after the sweating stage. If there be much distension of the stomach, and nausea, or sickness in the cold stage, an emetic of mustard (one table-spoonful to a tumbler of warm water) should be given. Should the patient be constipated, a dose of castor oil or Epsom salts may be given, just to open the bowels gently.

Remittent fever may be treated by giving quinine regularly and in frequently repeated small doses (5 grains every four hours).

The treatment of malarial cachexia should consist in removal of the patient as soon as possible to a colder climate, good and nourishing diet, cold baths, and in giving quinine with small doses of iron (see Prescription No. IV.).

In the treatment of malarial fever, it should not be forgotten that quinine is apt to produce troublesome and even serious symptoms when given in large doses, or to persons who are very susceptible to the action of the drug. In such cases the dose should be diminished, and the remedy given less frequently.

MALTA OR MEDITERRANEAN FEVER is most prevalent in the months of May, June, and July. The period of incubation is uncertain. This disease, though very exhausting and of long duration, seldom causes death.

Symptoms.—It has a preliminary stage lasting from one to two weeks, during which the patient is in low spirits, and suffers from sleeplessness, headache, and loss of appetite. These symptoms disappear suddenly at the end of this stage, and are followed by fever with profuse perspiration, and the patient, though able to sleep well and to take a good supply of food, loses flesh and becomes sallow, very weak, and despondent. A marked peculiarity of this feverish condition is its long duration. It may last for months, and even for a whole year. Its average duration is about ninety days. Another peculiarity is the frequent occurrence of sharp rheumatic pains and swelling in the joints. Occasionally one of the testicles becomes swollen and inflamed. The bowels are usually constipated.

Treatment.—The patient should be removed as soon as

possible to a colder climate. Medicine will have no effect on the duration or intensity of the fever. If the skin be very hot, cold sponging and, in extreme cases, a prolonged cold bath may give relief. The patient should be nourished on milk, beef-tea, eggs, and be kept, whilst the fever lasts, to a fluid diet. Brandy or whisky may be given to support the strength, and as the patient must be kept for many weeks on restricted fare, it will be necessary that he take lemon drink or lime juice in order to ward off scurvy.

YELLOW FEVER.—The range of this disease is fortunately much restricted. It is essentially a malady of hot countries and hot seasons, but in a severe and endemic form is seldom met with beyond the Gulf of Mexico and the West Indies, a part of the west coast of North America, the Guinea coast, and Brazil. It is confined to the sea-coast and the banks of large rivers, and prevails especially in the dirtiest and most neglected parts of seaports. It may break out at sea amongst the inmates of filthy and ill-ventilated forecastles, and has been often carried by ships from infected districts to parts previously free from the disease.

The progress of an epidemic of yellow fever is favoured by heat, checked by cool weather, and completely arrested by frost. The poison, though rendered inert, is not killed by frost. Instances have been recorded of this disease attacking a crew off the Gulf coast, becoming diminished in higher latitudes, and ceasing altogether off the coast of Newfoundland, to break out again on the return of the ship to southern waters.

Yellow fever, in the opinion of most authorities, is not caused by direct contagion. Like cholera, it is not caught by one person directly from another, but is contracted by two or more persons from a common source of infection. Unlike cholera, it is not spread by means of contaminated drinking water. It very rarely attacks those who have once suffered from it, and who have resided for a long time in a district in which it is very prevalent.

Symptoms.—This disease, in most cases, comes on suddenly, and runs a rapid course. In well-marked cases it presents two distinct stages, the first of high fever, the second of prostration and collapse. Its special, though not constant, signs are yellowness of the skin and black vomit. The symptoms of the first or "fever" stage are a chill at first, followed by high fever, with hot skin, flushed face and blood-shot eyes, headache, restlessness, intense thirst, severe pains in the lower part of the back and in the limbs, pain in the stomach, vomiting, constipation; in this stage the skin may become yellow, and small yellow boils break out about the mouth.

On the fourth or fifth day, after the above symptoms have been much relieved and the patient seems to be recovering, the second stage usually sets in. This is marked by distinct yellowness of the face and eyes, severe pain in the stomach, coldness of the surface of the body, vomiting of dark coloured fluid, drowsiness, extreme prostration, and, in very bad cases, bleeding from the nose and mouth, patches resembling bruises on the skin, a dark yellow staining of the surface, obstinate "black" vomiting, delirium, and convulsions.

Treatment.—As there is not at present any special remedy for yellow fever, such as quinine is in cases of malarial fever, and as the stomach is very irritable it would be well, in the absence of a medical man, to refrain from giving any medicine, except a purgative at an early stage. At the commencement of the fever, and before vomiting has set in, a large dose (2 ounces) of castor oil may be given. During the hot stage ice or cold water should be kept constantly applied to the head, and the body should be frequently sponged with cold water, hot-water bottles being at the same time applied to the feet. If there be much pain in the stomach and a tendency to vomiting, a mustard poultice over the upper part of the belly may give relief. The patient during the first stage should not take any food but, in order to assuage his thirst, should suck ice constantly or take frequently repeated cups of cold water, soda-water, or lemon drink. In the stage of prostration, when the surface of the body is cold and the pulse slow, stimulants should be given in small quantities—a teaspoonful of iced brandy or 2 teaspoonfuls of iced champagne every quarter of an hour. Mustard poultices or, if the skin be very red from the previous application of these, hot fomentations should be applied over the stomach and across the loins.

In cases of recovery care should be taken not to give too much food at first, lest the stomach be irritated and vomiting renewed. For the first two or three days of convalescence the diet should consist of iced milk and weak beef tea or broth frequently given in small quantities.

Precautions.—A man when supposed to be suffering from yellow fever should be isolated without delay and be treated in an airy space, if possible in a small tent on deck, or in a boat protected by an awning.

The cabin or forecastle previously occupied by the patient should be thoroughly cleansed and disinfected, the latrines and W.-C.'s also cleansed, the bilge purified, and the hold also, if

empty, disinfected. The patient's clothes should be either destroyed or boiled (see *Disinfection*, p. 20).

If the vessel be in an infected port the crew should (a) be kept on board as far as may be practicable and never be allowed to sleep on shore; (b) they should not be exposed to the sun in the middle of the day or be exhausted or overheated by hard work; (c) excesses of all kinds, especially in the use of alcoholic drinks, should be avoided.*

DENGUE FEVER (*Dandy fever; Break-bone fever; Broken-wing fever; Three-day fever; Bouquet and Bucket fever*).—This is a disease of the tropics and of hot seasons, being met with along the coasts of hot countries, and being much more prevalent in warm than in cool months. It is believed to be infectious. The incubation period is a short one, varying in different cases from two to five days.

Symptoms.—The disease lasts from five to eight days, and usually presents three well-marked stages—the first of high fever, intense headache, rheumatic pains, and a rash often resembling that of scarlet fever; then a period during which these symptoms are much relieved or subside altogether; and a third stage of renewed fever and profuse sweating, and a second rash, in most cases like that of nettle-rash, which shows itself first in the hands, and afterwards spreads to the rest of the body. This disease is often followed by a very prolonged period of weakness and painful swellings in the joints. Although its symptoms during the stages of fever are severe and alarming it is not very serious, and seldom causes death, unless the patient has been weakened by some other affection.

Treatment.—Very little, if any, medical treatment is needed. No purgative should be given unless the patient be obstinately constipated. The diet during the course of the disease should consist of milk and barley water, but afterwards, in the stage of convalescence, strong beef tea, nourishing soup and eggs, with small quantities of whisky or brandy should be given. During the high fever much relief may be given by sponging with cold water or vinegar and water. If the second rash be irritating and painful the patient should take a warm bath. The rheumatic pains, should they be very severe, and keep the patient awake, may be treated by bromide of potassium ($\frac{1}{2}$ dram to a wine-glassful of water).

PLAGUE.—This disease, which breaks out from time to time into wide and severe epidemics in China, Persia, and Arabia,

* Sternberg, in Davidson's *Hygiene and Diseases of Warm Climates*, p. 303.

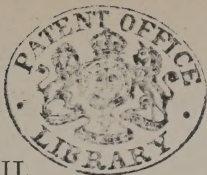
might appear on board a vessel during a stay in an infected port or after taking in an affected cargo.

Symptoms.—Plague is a low fever with well-marked nervous symptoms and large and inflamed swellings (buboes) in the groin armpit, and neck. The following are the usual symptoms in the order of their appearances:—Sharp pain in the loins; headache; shivering; a very white tongue; high fever, with restlessness and delirium; large red buboes most frequently in one groin or one armpit, sometimes in the neck, which often break down into foul and sloughy abscesses; small carbuncles; and dark red or purple spots and patches scattered over the surface of the body. In the early stages of the disease the patient is often heavy and “dazed,” as if under the influence of drink. In very bad cases there is bleeding from the nose, lungs, and bowels. This disease is a very serious one, the mortality in severe epidemics being over 70 per cent. The fever generally increases from day to day, the buboes become gangrenous, and the patient sinks from exhaustion. “Should the patient survive the seventh day recovery is probable” (*Montagu Lubbock*).

Precautions.—As plague is a very contagious disease, the patient should be strictly isolated, and the same precautions should be taken as in dealing with a case of cholera. The sick berth ought to be *well ventilated*, as much importance is attached in the treatment of this disease to an abundant and constantly renewed supply of fresh air.

Treatment.—The patient's strength should be supported by strong beef tea, milk, and port wine or brandy in small, but frequently repeated, doses. Quinine should be given in powder (5 to 8 grains) every four or six hours. The buboes and carbuncles when red and painful should be covered by poultices or hot fomentations, and, after they have burst, be frequently cleansed and dressed with carbolic acid solution (2 drams to $\frac{1}{2}$ pint of water); and when the discharge is very profuse and offensive they should also be covered, over the carbolic dressing, by thick layers of oakum dusted with iodoform or coffee.

Plague, like yellow fever, is subject to quarantine in British, as well as in foreign, ports.



CHAPTER VII.

CHOLERA, BERIBERI, SCURVY, RHEUMATISM.

Cholera:—SYMPTOMS—TREATMENT—PREVENTIVE MEASURES. **Beriberi:**
 —SYMPTOMS—PREVENTIVE MEASURES—TREATMENT. **Scurvy:**—
 SYMPTOMS—TREATMENT. **Rheumatism:**—RHEUMATIC FEVER—
 CHRONIC RHEUMATISM—MUSCULAR RHEUMATISM.

CHOLERA.—*Symptoms.*—The chief symptoms of this dreaded disease are diarrhœa, with an almost continuous discharge of thin watery stools resembling rice water; violent vomiting; severe cramps in the belly, legs, and thighs; extreme prostration; chilling of the surface of the body; and collapse.

The *first stage* is marked by diarrhœa, pain in the stomach, thirst, severe cramping pains, restlessness, a husky voice.

In the *second stage* there is vomiting as well as purging, the body is shrunk and the surface cold and livid. The patient though very weak, is still restless, and complains much of thirst and cramps.

The *third stage* is one of complete torpor and collapse, the patient is cold and pulseless, and the skin is covered by a clammy perspiration.

If the patient recovers from his attack the bad symptoms disappear quickly; but during the stage of convalescence he may suffer from inflammation of the bowels, from difficulty in breathing, from stoppage of the secretion of urine, or from general weakness.

The severity of the attack varies in different cases. The patient may recover at the end of the first or second stage, or may be carried off in a state of collapse within a few hours. The attack may come on very suddenly and without warning, or be preceded by diarrhœa of a few days' duration. If the patient survive until the third day the prospects of recovery will be good.

The incubation period is uncertain; it is believed that whilst usually varying from two to four days, it may in rare instances, extend over two weeks.

There are good reasons for assuming that cholera cannot be caught directly by one person from another. It is communicated in most instances by drinking water contaminated by the stools and vomited matter from a person suffering from the disease.

Probably in a small and badly ventilated space, occupied by one or more cholera patients, the air may become so foul and so fully charged with the germs of the disease as to be capable of poisoning any exposed drinking fluid. The poison of cholera may be effectually destroyed by heat (p. 20) and by carbolic acid, corrosive sublimate, and other powerful antiseptics. When deposited on dry cloth or linen it may retain its potency for some weeks, and be capable of working mischief if submitted to the action of warmth and moisture. Hence the dangers of carrying rags from an infected region, and of preserving the soiled and still infected linen of a person attacked by the disease.

Although cholera has always been carried from the East to Europe by land, and not by water, and although it is held on good authority that the best way of dealing with the disease when it has attacked those on board ship in an infected port is to put out to sea, yet the strict precautions taken by the Medical Officers of British ports are fully justified by the fact that from time to time very serious epidemics have occurred on ships when far away from the land.

Treatment.—In the first stage endeavour should be made to stop the diarrhoea, and to prevent early prostration. A draught containing laudanum and elixir of vitriol (10 drops of laudanum and 20 drops of the elixir in an ounce of water) should be given every three hours; and a large mustard poultice be applied over the belly. No food of any kind should be given, but, with the object of relieving thirst, the patient should suck small pieces of ice, or if this cannot be obtained, take from time to time small sips of cold water. If the symptoms become more severe, and there be much vomiting as well as purging, the patient should still suck ice, and be kept warm by mustard poultices over the belly, and hot-water bottles to the feet and on each side of the body. It would be well at this stage to discontinue the laudanum, and to give—if the patient can keep it down—1 dram of paregoric in an ounce of water every three hours. The cramps may be relieved by rubbing with the warm hand. Alcohol should not be given, as it can do no good, and may cause positive harm by irritating the stomach and bowels. Should the patient live through the attack, great care must be taken in regulating his diet during the stages of reaction and convalescence, as over-feeding might bring on vomiting again, and cause inflammation of the bowels. Milk and weak beef tea, if given frequently in *small* quantities, will suffice to keep up his strength. If the stomach remain irritable, beef tea may be injected into the lower bowel by an enema syringe.

Preventive Measures.—The following precautions should be taken in the event of a case of cholera on board ship, in order to guard against any spreading of the disease :—

The patient must be separated from the rest of the crew, and be kept in a well-ventilated berth, or, if possible, in a tent on deck.

The cabin or fore-castle previously occupied by him should be thoroughly cleaned and disinfected, and all loose pieces of cloth or linen should, after disinfection, be burnt or thrown overboard (see *Disinfection*, p. 20).

All clothing and linen previously used by the patient should be carefully disinfected by boiling in water, or by immersion in a 5 per cent. solution of carbolic acid, then sewn up in a thick piece of canvas, and either set apart until the end of the passage or be thrown overboard.

The patient's stools should be received into a bed-pan or some other suitable vessel containing some of the carbolic acid solution. Some more of this solution should be poured over the discharged stools, which should then be immediately thrown overboard. The bed-pan, whenever it has been used, should be thoroughly cleaned with sea water, and whilst disused, contain some of the carbolic solution.

The bed linen should be changed every day, if possible, and all the pieces already used and soiled should be thoroughly disinfected by carbolic acid, weighted, and thrown overboard.

A basin containing some 5 per cent. solution of carbolic acid, further diluted by adding as much water, should be kept near the patient's bed. Into this the hands of the attendant should be frequently dipped, especially when they have been soiled with vomit or stools.

At the end of the attack the bedding and any loose woven material likely to have been soiled by the vomit or the stools of the patient should be first disinfected and then thrown overboard.

In case of death, the body should be enclosed in a sheet well saturated with carbolic acid solution, and buried in the course of a few hours.

BERIBERI (Kakké).—This infectious disease, which is very probably caused by a parasite, prevails amongst the natives of tropical and sub-tropical countries, especially in Japan, the Malay Archipelago, and on the Malabar Coast. It occasionally breaks out in crews of coloured men at sea, and several cases are admitted every year into sailors' hospitals in this country.

Symptoms.—The symptoms vary in different cases, are often obscure, and may be confounded with those of other diseases.

The most marked and constant signs are tenderness of the calves, numbness of the tips of the fingers, and of the feet and legs, loss of muscular power and extreme weakness, so that the patient, slow and listless at first in doing his work, becomes after a time so feeble that he is unable even to turn in his bunk. The patient complains of palpitation and short breathing, and in many cases death occurs suddenly from stoppage of the heart's action. Dropsy, usually in the lower limbs, but sometimes in the arms and upper part of the body, often occurs, but is sometimes absent, a distinction being thus made between "wet" and "dry" forms of the disease.

Damp and heat favour the spreading of beriberi. There are no good grounds for concluding that it is directly caused by an almost exclusive consumption of rice, or by defective diet.

Preventive Measures.—With regard to the prevention of beriberi on board ship, it has been asserted that "the periodical cleansing of holds, and above all, forecastles, ought to be attended to. If the crew's quarters were fumigated with sulphur or chlorine in the same thorough way in which ships' holds are fumigated to kill rats and cockroaches, and the crew forced to submit their clothes, chests, and other belongings to the same process, and be compelled to keep port-holes and ventilators open, great benefit would ensue, and many deaths and much invaliding and inefficiency prevented. At the same time, wholesome and nourishing rations should be supplied in sufficient quantity, and measures taken to insure that they are consumed."*

Treatment.—A sailor suffering from beriberi should be at once removed from the rest of the crew and placed in a well ventilated place on deck—if practicable, in a small tent. He should be kept at rest, and be fed on easily digestible and nutritious food, consisting of *meat*, fresh or preserved vegetables, and a reduced quantity of rice. That the bowels may be relieved daily a moderate dose (2 drams) of Epsom salts should be given every, or every other, morning. If the breathing should at any time become very difficult, and the face dusky, free purging by calomel (5 grains) or croton oil (1 drop) may give relief.

S C U R V Y.—This preventable disease, though actually abolished in the Royal Navy, and now, there is good reason to believe, fast disappearing in the mercantile marine of this and other maritime countries, will always be likely to follow any neglect, or unforeseen difficulty, in the provisioning of a ship's crew. There can be no doubt that its almost invariable cause

* Dr. Patrick Manson, in Davidson's *Hygiene and Diseases of Warm Climates*, p. 499.

is a scarcity or total absence in the diet of fresh vegetables, or of such constituents of vegetable food as exist in the juice of limes and other succulent fruits. As land scurvy, once so prevalent in Europe, has been extinguished by the general cultivation of the potato and of green vegetables, so at sea a like disease has of late been very much reduced, both in extent and severity, by improved dietaries, and a better appreciation of the efficacy of antiscorbutics.

Symptoms.—In scurvy, as in most other diseases, the first to suffer are those who have been weakened by previous disease, over-work, or old age. The most striking features of the disease are the spongy and swollen gums, and a breaking out over the body, especially on the legs, of small purple spots and large livid patches resembling bruises. The flesh at the back of the thigh and in the calves is often swollen and very hard. The patient has a peculiar sallow complexion and is often so *weak that he faints when allowed to sit up*. If there be any old sores on the leg these become black and foul, and show a tendency to bleed.

Treatment.—These symptoms will soon disappear if the patient can be liberally supplied with fresh vegetables, together with a nutritious diet of minced meat, soup, and milk, and some ale or porter. If fresh and green vegetables cannot be obtained a double allowance of preserved vegetables should be given, together with "lime juice at the rate of from 3 to 4 ounces daily, mixed with about eight times its bulk of water and sweetened to taste" (*Harry Leach*). The patient may wash out his mouth from time to time with a mixture of one part of crimson fluid and four parts of distilled water. No medicine will be needed, and mercury in any form should be regarded as a poison. *Care must be taken to keep the patient on his back, lest sudden rising should cause fainting and death.*

RHEUMATISM.

RHEUMATIC FEVER, or *Acute Rheumatism*.—The patient is hot and feverish and sweats very freely, the perspiration having a peculiar sour smell; two, three, or more joints—most frequently the knees, ankles, and elbows—are tender, red, and swollen; in very severe cases the temperature is very high (104° , 105°), and there may be sharp pain over the heart with short breathing and flushed face.

As rheumatic fever is often followed by heart disease, the patient, if he complain of shortness of breath and of pain on the left side of the chest after recovery from the attack, should be

kept at rest for the remainder of the voyage, and be sent on shore as early as possible for medical treatment.

Treatment.—The patient must be kept warm on a bed or soft mattress, and lie between blankets. The painful joints should be covered by thick layers of cotton wool or, this failing, clean flannel, and, over these, layers of clean oakum. The bed-pan must be always in readiness as the patient will probably be unable to move, and be obliged to pass his urine and stools as he lies. Salicin should be given every four hours in doses of 20 grains to an ounce of water for the first two days, and, afterwards, in 15 grain doses until the attack has passed off, when it should still be continued for about a week in doses of 8 or 10 grains. Should the patient complain of noises in the ears and of deafness during the use of salicin, the dose must be reduced by one-half. If there be much pain in the joints and restlessness half a dram of bromide of potassium may be given in an ounce of water in the evening.

Severe pain over the heart and shortness of breath should be treated by the application of mustard poultices over the front of the chest on the left side, until the skin is slightly blistered.

In the acute stage of rheumatic fever no meat, beef tea, or soup should be given, but only milk mixed with some effervescing water, or arrowroot and barley water: lemon- or lime-juice drink, may be freely supplied.

CHRONIC RHEUMATISM is very common amongst seamen, especially those beyond middle age. It is an obstinate affection which subsides or disappears in warm weather, and returns again and again in cold climates and after exposure to wet. The pain in the joints is usually more severe at night, and when the patient is in bed. There is very little, if any, swelling of the painful joints, but generally much stiffness, with a heavy pain in the flesh of the affected limbs.

Treatment.—The patient, when in cool climates, should be warmly clad, and should avoid, as far as possible, exposure to wet and cold. The painful joint should be well rubbed night and morning with turpentine liniment or opodeldoc, and then be covered with a flannel bandage. The diet should be a full and nourishing one, but malt liquor and spirits must be strictly forbidden.

GONORRHOEAL RHEUMATISM (see Chapter xxvii).

MUSCULAR RHEUMATISM.—The most common forms of this affection are lumbago, stiff neck, and a "stitch" in the chest (pleurodynia. see p. 96).

Treatment.—The pain and stiffness may in each of these be

removed or much relieved by a warm bath, by the application to the seat of trouble of a linseed poultice, or a hot-water bottle wrapped in flannel, and by taking at bed-time 10 grains of Dover's powder, and on the following morning 2 drams of Epsom salts in a wineglassful of warm water.

CHAPTER VIII.

HEADACHE, SEA SICKNESS, DELIRIUM TREMENS.

Headache:—TREATMENT. Sea Sickness:—SYMPTOMS—TREATMENT.
Delirium Tremens:—SYMPTOMS—TREATMENT.

HEADACHE occurs as a symptom in many general affections, especially fevers, and when severe and persistent, and associated with high fever, should lead to a suspicion that the patient may have caught some infectious disease (typhoid, yellow fever, small-pox, &c.). It is due also to a great many other causes, of which probably the most frequent in seamen are:—Free drinking after a long voyage, exposure to heat in warm climates, indigestion, malaria, and syphilis.

Treatment.—The headache due to free indulgence in bad spirits will, in most instances, be speedily removed by abstinence, rest, and low diet. When caused by heat it will usually cease if the patient avoid exposure to the sun as much as possible, and take for a time very little, if any, animal food. The headache resulting from indigestion, and associated with pain after meals, loss of appetite, and a bad tongue, may be relieved by an occasional blue pill (5 grains) at night, and a draught of bicarbonate of soda (20 grains in 1 oz. of water) three or four times in the day. In neuralgic headache from malaria, which is usually severe while it lasts, affects one side of the head, and comes on at regular intervals, quinine should be given in doses of from 5 to 10 grains. Severe headache fixed to one part of the scalp, and coming on at night after relief or complete cessation during the day, should be treated by iodide of potassium (from 5 to 10 grains to 1 oz. of water) every four hours. In most cases of so-called sick headache in young persons, a draught of bromide of potassium (15 to 20 grains) will often give much relief. In cases of fixed and severe headache, with occasional vomiting and drowsiness, lasting for some days, the patient should be kept at

rest, and on very low diet, and placed under medical treatment at the earliest opportunity.

SEA-SICKNESS.—This distressing malady, from which even some old seamen are not exempt at the beginning of a voyage, seldom lasts longer than two or three days, and is, in most instances, speedily followed by complete recovery, with renewed appetite and general vigour. In some persons, however, especially weak lads, the attack often lasts longer and is very severe for many days, causing much prostration; and there are others who suffer still more, and remain sick and helpless during a long voyage.

The symptoms of sea-sickness are well known. The patient suffers not only from sickness, but also from bodily prostration and intense mental depression. The skin is cold and the limbs benumbed and useless, and there is often much suffering from headache and sharp pain in the stomach. Thirst is also a common symptom.

Treatment.—In no other affection, perhaps, have so many special remedies and different plans of treatment been recommended as in sea-sickness.* Still, though much can be done to keep off this affection, and to restore the prostrate patient after a bad and prolonged attack, it is, when once well developed, beyond the control of medicine, and will under ordinary circumstances run its full course. A passenger apt to suffer from the malady should for some two or three days before the time of starting live on a light but nutritious diet, being careful not to overload the stomach, and also to avoid any medicine beyond a morning dose of citrate of magnesia or some other mild aperient. When the sickness comes on the best course he can pursue, unless the weather be very rough, is to remain on deck warmly clad, and lying on a deck-chair or some other long seat, and to take a tabloid or draught of bromide of potassium or ammonium (20 to 30 grains), with small and frequent sips of sherry and seltzer, or brandy and soda water. If sickness and exhaustion should follow, it would be well to get under cover and to lie down—if possible alone, in some airy berth—quite flat, so that the head is on the same level as the body. Ice should be sucked, and notwithstanding the nausea and sickness, champagne, brandy and water, or stout may be taken in very small and oft-repeated doses. In serious cases, in which the patient remains sick and

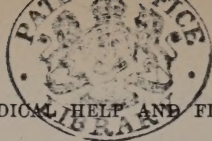
* Many of these are given by Dr. T. Dutton, the author of a little work on sea-sickness, who lays down some useful though rather elaborate instructions for warding off this disease, and recommends very strongly bromide of ammonium.

prostrate for many days, it will be necessary to apply hot fomentations or a mustard poultice over the stomach, to give a drop of creosote in a bread pill every three hours, and to supply as much arrowroot, jelly, and champagne or brandy and water as can be kept down. Should there be diarrhœa as well as sickness, a draught either of chlorodyne (15 to 20 drops in cold water), or of (laudanum 10 drops, chloric ether 15 drops, and water 1 ounce) may be given, and if necessary repeated twice at intervals of three hours.

DELIRIUM TREMENS.—This disease, called by old seamen “an attack of the horrors,” affects mostly seasoned or chronic drinkers, and may follow either a heavy drinking bout or a sudden and complete abstinence from the habitual use of alcohol. It often occurs when a drinker is laid up from injury or disease, and put on low diet.

Symptoms.—The main symptoms, as the name indicates, are delirium and muscular trembling. The patient is very talkative, and at times noisy, and the hands and tongue are in a state of constant quivering. There is much restlessness and often wild excitement, the patient attempting to get up and to make his escape from some imaginary danger. He gets no sleep, has no desire for solid food, and often begs for drink. In a very severe attack he may die from sheer exhaustion, the skin becoming cold and the tongue dry and dirty.

Treatment.—In the absence of a medical man the main objects to carry out should be to restrain the patient with as little violence as possible, prevent him from going overboard, send him to sleep, and keep up his strength. In using restraint, one should trust rather to the efforts of one or more attendants than to a “strong sheet,” which may, especially in warm weather, cause much sweating and exhaustion. With the aim of procuring sleep, bromide of potassium (half a dram to an ounce of water) should be given every three hours. Efforts should be made to feed the patient with strong soup or beef tea, and, if possible, milk and eggs. Beer may be given freely, and should the bromide of potassium fail to put the patient to sleep, a “strong” glass of whisky and hot water may be added to the evening dose.



CHAPTER IX.

DISEASES OF THE THROAT, DIGESTIVE ORGANS, KIDNEYS, AND LIVER.

Diseases of the Throat:—QUINSY—ULCERATION OF THE THROAT—INDIGESTION—VOMITING—COLIC—GALL-STONE COLIC—RENAL COLIC. Diseases of the Digestive Organs, Kidneys, and Liver:—DIARRHŒA — DYSENTERY — SPRUE — JAUNDICE — LIVER ABSCESS — INTESTINAL WORMS.

DISEASES OF THE THROAT.

QUINSY, OR INFLAMMATION OF THE THROAT.—This, though an alarming and very painful malady, generally ends in recovery. It occurs mostly in lads or young men, and is apt to attack the same patient again and again, after exposure to cold or sudden changes in weather.

Symptoms.—It begins in most cases with a shivering fit, after which the patient becomes very feverish and often depressed in spirits. He feels that his throat is sore, and that there is much discomfort in swallowing. In the course of a few hours the pain becomes more severe, and swallowing so difficult, that the saliva collects in the mouth and dribbles away from the lips. The upper part of the neck, just behind the lower jaw, on one or both sides, is very tender and often swollen. If the patient can open his mouth, and if the swollen, moist, and white-coated tongue can be pressed down by the flat handle of a spoon, or by a paper knife, the entrance to the throat will be found blocked by a large red swelling—the inflamed tonsil. The breathing is impeded and sometimes noisy, and the patient snores very loudly in his sleep. These symptoms may subside rapidly on the fourth or fifth day, but may be renewed after a short interval of relief, in consequence of swelling of the opposite tonsil, or may continue some two or three days longer, and become still more severe, through the formation of an abscess at the back of the mouth.

Treatment.—The patient, who can take but very little nourishment during the attack, should sip cold water or suck pieces of ice. The throat should be frequently gargled with warm water. The tenderness in the neck may be relieved by poultic-

ing (linseed meal) or by fomentations. If matter should form, the abscess must not be pricked or cut; it will burst without interference in the course of a day or two, and the severe symptoms will then disappear at once, and the patient will make a rapid recovery. He should, for some few days after the attack, be fed on soup, eggs, arrowroot, with ale or stout.

ULCERATION OF THE THROAT, if deep and extensive and not very painful, should be treated by iodide of potassium, given at first in small doses (3 grains in a wineglassful of water), and gradually increased in quantity up to doses of 10 or 15 grains, provided there be no symptoms of the disturbance that is sometimes produced by this drug. If the patient be evidently suffering from consumption, he should be treated simply by good nourishment, with port wine, and not by iodide of potassium.

DISEASES OF THE DIGESTIVE ORGANS, KIDNEYS, AND LIVER.

INDIGESTION (*Dyspepsia*).—This affection is a frequent source of trouble to seamen.

Symptoms.—Its ordinary symptoms are pain in the stomach and back, coming on soon after each meal, wind in the stomach and bowels, constipation with occasional looseness, palpitation and heartburn, headache, and a coated or dirty tongue.

Causes.—Of its many causes some are preventable, as excess in smoking and drinking, immoderate and hasty feeding, drinking large draughts of cold water in hot weather and after hard work. On board ocean ships indigestion is, in most cases, the result of the “sameness” of the diet, the food, which is never well suited to weak stomachs, and often badly cooked, being necessarily but little varied for many weeks.

Treatment.—If the patient be given to excessive use of alcohol or tobacco he should, in the former case, drink less, and, in the latter, either smoke or chew less, or consume weaker tobacco. He should content himself for a time with less food, and take little, if any, fat, sugar, and duff. A purging pill (6 grains) should be given every third night, and a full dose of Epsom salts ($\frac{1}{2}$ ounce) in half a tumblerful of warm water the next morning. In the course of the day a draught containing elixir of vitriol (15 to 20 drops), and laudanum (5 drops) to an ounce of cold water should be taken soon after each meal. If this fail to give relief the patient might take, between meals, a mixture of bicarbonate of soda (20 grains), essence of ginger (10 drops), chloric ether ($\frac{1}{2}$ dram) to an ounce of water.

Vomiting not only occurs in connection with other and more serious symptoms in many diseases affecting the whole system, such as cholera, yellow fever, blood-poisoning, &c., but is often met with as the most marked and urgent, if not the sole disturbance. In a large proportion of cases it is due either to an overloaded stomach or to the presence in this organ of matter that ought not to be there, as, for instance, unripe fruit, tainted meat or fish, or some poison. In such instances it is necessary to assist what is really an effort of nature, and to empty the stomach by giving an emetic.

Troublesome vomiting of small quantities of green or yellow fluid, mixed with partly digested food, is a frequent result of disordered liver and of indigestion; it may be much relieved and probably removed by putting the patient on a spare and fluid diet for a few days, and giving every third or fourth night 5 grains of blue pill and in the following morning a dose (2 drams) of Epsom salts in warm water.

Frequent vomiting of thick yellow fluid, which is often frothy like yeast and sometimes stained by dark coloured blood, in an old man who has lately lost flesh and strength, is to be regarded as a bad sign as indicating an obstruction—probably due to cancer—to the passage of food from the stomach into the bowels. This form of sickness may be relieved by feeding the patient on milk mixed with lime water or soda water and by giving, two or three times in the day, a drop of creosote on a small piece of soft bread made into a pill.

If in a thin and weak man past middle age the food be returned unchanged almost immediately after it has been swallowed, and if there be frequent spitting of thin frothy fluid, and much difficulty in swallowing food, particularly solids, the vomiting will most likely be due to disease and stricture of the gullet. If these symptoms have lasted for many weeks, and the man is suffering much from pain when he attempts to take any nourishment, relief may be given by getting him to swallow now and then a teaspoonful of olive oil. He should be fed on soups, and, if possible, milk should be given frequently in small quantities.

A very serious form of vomiting is that in which the patient brings up much thick fluid, resembling in colour and smell fluid stools. Such vomiting is usually the result of obstruction, and should always lead one to examine the groins and the navel of the patient for rupture (see *Strangulated Rupture*, Chapter xxvi.). If no rupture can be found it may be due either to internal stoppage or, if there be constant intense pain in the belly, to inflammation

of the bowels. If there be a rupture rest and the application of ice to the swelling might possibly soften the swelling, so that it can be put up by gentle kneading and pressure. If the rupture cannot be put up, or if the brown vomiting be due to some internal stoppage, all that can be done is to apply fomentations to the belly, and to give laudanum (10 drops) or an opium pill (5 grains) every four hours.

In cases of severe and often repeated vomiting the patient should be kept in bed. He should suck ice or sip small quantities of cold water and take no nourishment, save milk mixed with sodawater. If he be faint or complain of headache he should lie quite flat with the head low, and cold (iced or cold water) should be applied to the forehead. A mustard poultice over the pit of the stomach will in many cases give much relief. The patient should lie on his back or the *left* side, as lying on the *right* side tends to increase the vomiting.

COLIC.—The symptoms of an ordinary attack of colic are sharp twisting pains in the bowels, occurring at frequent intervals after short stages of almost complete relief. The attack in most instances comes on suddenly, and, after suitable treatment, rapidly subsides, leaving the patient quite well. The pains, which are very severe whilst they last, may be relieved by firm pressure of the hand on the belly.

Causes.—Colic is often caused by some unusual or indigestible article of food, or by copious draughts of very cold water. In such cases there is usually sickness. It occurs also as a result of very obstinate constipation from a collection of hardened stools in the lower bowel. It may be due to lead poisoning, the drinking water, perhaps, having been contaminated by a leaden cistern or pipe, or the patient may have been engaged in painting.

Treatment.—Half an ounce of castor oil with 8 drops of laudanum should be given every three hours until the pains have been relieved, and hot fomentations should be frequently applied over the belly. In cases of long-continued and obstinate constipation, it would be well to give an enema of 1 pint of warm olive oil, the lower part of the patient's body being raised, whilst this is given, by pillows. If there be any reason to suspect that the colic is due to lead poisoning, Epsom salts in doses of $\frac{1}{2}$ oz. should be given instead of castor oil, and for some days after the attack a draught of 2 drams of Epsom salts and 5 grains of iodide of potassium should be given every morning.

GALL-STONE COLIC.—The passage of a gall-stone from the liver to the bowels causes repeated attacks of very intense and alarming pain on the right side of the belly below the ribs,

with shivering and fever, and occasional vomiting. The attack usually subsides suddenly after a duration varying in different cases from a few hours to two or three days, and is followed by jaundice, the skin of the face and body, and the eyes becoming yellow. In many cases a stone may be found in the stools.

Treatment.—The patient should be kept in a hot bath for about half an hour, and, afterwards, on being placed in his bunk, be well and frequently fomented over the seat of pain, and take 15 drops of laudanum in a wineglassful of warm water. This draught may be repeated two or three times at intervals of six hours if the pain still continue.

Should the patient suffer from two or more of these attacks in the course of a voyage, it would be well for him to be careful in his diet, and to take only lean meat and eggs, avoiding fat, sugar, puddings, and spirits and beer.

RENAL OR KIDNEY COLIC.—This painful affection is caused by the passage of a stone along the narrow tube (ureter) by which the urine is carried from the kidney to the bladder. The attacks of pain are even more severe than those of gall-stone colic, and have been known to cause convulsions. They are most intense in one loin, and shoot down towards the groin and thigh on the same side. The corresponding testicle is also very painful, and may be dragged upwards. The urine, which is passed frequently in very small quantities, is often mixed with blood. The attack, as a rule, does not last long, and usually begins and ends suddenly.

Treatment.—The patient should drink as much warm water or soda water as he can keep down, and take every three hours, whilst the attack lasts, 1 dram of bromide of potassium and $\frac{1}{2}$ dram of sweet spirits of nitre in a wineglassful of water. Hot fomentations, over which some laudanum may be sprinkled (see Chapter xxxi.), should be frequently applied to the painful loin.

DIARRHŒA.—Looseness of the bowels is a common complaint on board ship, as a result of (a) bad or badly cooked food; (b) indulgence in sour or over-ripe fruit; (c) drinking of sour wine and bad spirits; (d) a sudden change from cold to warm weather; (e) a change of diet, as when fresh meat is taken after long feeding on ship's provisions; (f) contamination of water used in cooking with sea water (*Coppinger*).

It is in most instances a short and trivial malady, and though it may for a time cause some trouble, it usually does good rather than harm, and may be regarded as a natural means of getting rid of some irritating and, perhaps, poisonous material. In some

cases, however, it is a symptom of some very serious disease. Persistent looseness of the bowels may be due to dysentery, sprue, or some other form of tropical diarrhœa; and in districts in which cholera prevails, or is not unlikely to occur, a sudden attack of diarrhœa may be the beginning of this disease.

Continued diarrhœa of light coloured stools, with fever, headache, and prostration coming on in patients who had recently been quite healthy, should excite a suspicion of typhoid fever.

Treatment.—In ordinary and mild cases the looseness will pass off after a few hours' rest, the patient taking nothing except some cold water or milk and water. If there be much griping, with nausea or sickness, $\frac{1}{2}$ ounce of castor oil, with 10 drops of laudanum, should be given, and hot flannels be applied over the belly. Should the purging continue unchecked, half a dram of the diarrhœa powder (see *Scale of Medicines*) may be given every four hours.

If the diarrhœa be very severe and the patient become pale and cold, and suffer from vomiting and sharp pains in the belly, he should be treated by doses of laudanum (10 drops in a table-spoonful of cold water every four hours), or Dover's powder (5 grains every two hours), and be kept warm, and supplied with small and frequently repeated quantities of brandy and iced or cold water. For some two or three days after the subsidence of the attack the patient should be kept at rest, and be freely supplied with beef tea, arrowroot, milk, if available, and good brandy or port.

Precautions.—If there be any reason to dread an attack of cholera, the patient suffering from diarrhœa should be treated by a mixture of laudanum and elixir of vitriol (laudanum, 10 drops, elixir of vitriol, 15 drops, in an ounce of water, to be taken every three hours), and a mustard poultice should be applied over the stomach. He should take nothing else by the mouth save sips of cold water or small pieces of ice.

DYSENTERY.—The well-known symptoms of this disease are for the most part due to inflammation, and, in severe and protracted cases, to subsequent ulceration and gangrenous destruction of the internal coat of the large intestine. It is widely diffused, but is most prevalent in tropical climates. In Europe it is almost always present in the southern parts of Spain and Italy, in Greece, and on the shores of the Black Sea. Though still a frequent disease on board ship, it has during the last ten years diminished in extent and severity amongst British seamen.

Causes.—Dysentery is an epidemic, but not contagious, malady, which is caused either directly or indirectly—(a) by

drinking impure water; (*b*) by the use of bad, coarse, and salted meat; (*c*) by taking unripe or over-ripe fruit; (*d*) by excess in alcohol; (*e*) by insufficient food; (*f*) by breathing bad air. It is very prevalent in malarious districts, and dysentery and "fever and ague" often occur together in the same patient.

Symptoms.—An attack of dysentery usually begins with fever and diarrhoea. The patient afterwards complains of severe griping pains, and has a constant desire to go to stool, where he passes nothing but small quantities of slime and blood. There is often much pain in passing urine, which is discharged frequently in small quantities. These symptoms, if not relieved by suitable treatment in the course of two weeks, are followed by the condition known as chronic dysentery, in which the patient loses flesh rapidly, suffers much from griping and straining at stool, and passes small quantities of pale-coloured frothy matter of a most offensive smell. This condition is a serious and obstinate one, the patient usually going from bad to worse, with short periods of slight relief, and suffering in many instances from fever and ague, associated with rheumatism.

Abscess of the liver is a frequent result of dysentery.

Treatment.—A most important point in the treatment of dysentery, whether acute or chronic, is to keep the patient constantly at rest in his bunk. In the beginning of an acute attack, a tablespoonful of castor oil with 8 drops of laudanum should be given. The remedy on which most reliance is now placed is ipecacuanha, given in large doses. So long as the stools are scanty, and consist of slime and blood, and the patient is troubled by griping pains and straining at stool, 20 grains of ipecacuanha powder should be administered night and morning in a small quantity (2 teaspoonfuls) of milk or syrup. To prevent vomiting, which is likely to be caused by so large a dose of this emetic, a mustard poultice should be applied over the stomach, and the patient should avoid taking anything into the mouth, beyond small pieces of ice or small quantities of cold water, for the next three hours. The griping pains in the belly may be relieved by applying flannel well wrung out of hot water. As the painful symptoms are relieved, and the stools become natural, the use of large doses of ipecacuanha should cease, and no more medicine be given beyond Dover's powder (gr. x) for two or three nights.

If ipecacuanha cannot be obtained, or, when given, causes much sickness, Epsom salts (1 dram to an ounce of water) may be administered every three or four hours.

In the treatment of chronic dysentery, very little, if any, good can be done whilst the patient remains in a warm climate;

ipecacuanha should be given in smaller doses (8 to 15 grains) every four hours, and Dover's powder (10 grains) or opium pill (5 grains) every night. If there be any signs of "fever and ague," quinine should be given in 5-grain doses, and care must be taken to prevent scurvy by a daily allowance of lime-juice.

The diet in an acute or fresh attack of dysentery should be very spare, consisting only in barley water and milk mixed with lime water. During convalescence the return to the ordinary diet should be very gradual, the patient being fed for two or three weeks on milk, beef tea, arrowroot, eggs, and fish. In chronic dysentery milk should be the chief, and, if it can be obtained in sufficient quantity, the sole article of food.

In passing from a warm to a cooler climate, care must be taken to keep the patient warm, and to guard him against the risk of being chilled.

SPRUE.—Symptoms.—This variety of tropical diarrhoea is apt to be mistaken for chronic dysentery, as the patient becomes very thin and weak, loses colour, and suffers much from indigestion and irritability of the stomach. In sprue, however, there is little, if any, straining at stool, and the motions are copious, of a soft but not fluid consistence, and a greyish or yellow colour, and at times frothy. The mouth and throat are usually very sore, and the tongue is shrunken, glazed, and in some cases ulcerated.

Treatment.—There is only one effectual course of treatment in a case of sprue. The patient should be removed as soon as possible to a temperate climate, be kept constantly at rest, and be fed exclusively on milk, given very frequently in small quantities. Whilst at sea, and when milk cannot be obtained, he should take sopped bread, arrowroot, and then beef tea, with small quantities of brandy or sherry mixed with some effervescing water.

JAUNDICE.—Retention of bile in the liver gives rise to certain symptoms, the most evident of which is a yellow staining of the skin, and of the whites of the eyes. This yellow staining or *jaundice* is usually associated with loss of appetite and nausea, with constipation, and with itching of the skin. The urine is highly coloured, and the stools are very pale or quite white.

Unless it be one of the results of some severe and low fever, jaundice is, in most instances, caused by obstruction of the duct or tube which carries the bile from the liver to the small intestine. Such obstruction may be due to blocking of the tube by a gall-stone, or by the pressure of an internal tumour. In such cases the jaundice may last for some time, and the staining

of the skin become very deep. Most frequently, however, it is caused by a temporary swelling of the walls of the duct in consequence of irritation of the stomach and upper bowel, such as may be excited by free indulgence in bad spirits.

An attack of jaundice will, in most cases, cease in the course of a few days, if the patient be kept quiet and be restricted to a spare fluid diet without milk or fat. He should take a full dose of Epsom salts ($\frac{1}{2}$ ounce in a wineglassful of warm water) every morning until the yellowness has subsided. If there be much pain over the liver hot fomentations should be applied to the upper part of the belly on the right side, and, if it be possible, the patient should take a warm bath, and remain in it for about an hour.

In cases of deep and persistent jaundice the patient, whilst at sea, should be well supported by a nutritious diet, but at the same time must be careful to avoid all fat or greasy food, and also spirits.

LIVER ABSCESS.—This affection, though it has diminished very much in frequency amongst seamen during the past quarter of a century, is still occasionally met with in men who have spent much time in the tropics, and who have suffered, or are still suffering, from dysentery and “fever and ague.”

Symptoms.—The symptoms of liver abscess are—weakness, loss of flesh; a pale or yellow skin; temperature higher at night than in the morning, but usually never falling to the normal point (98.6°); pain over the liver, and often at the back of the right shoulder; a dry “catching” cough, breath often very short, the stomach very irritable, the patient complaining of loss of appetite; occasional chills and sweating. The patient lies either on his back or the right side, rarely on the left side.

When, as is often the case, the liver abscess bursts into the lung the patient coughs up almost constantly large quantities of thick frothy fluid of a red or light brown colour. When the abscess makes its way to the surface of the body it often forms a tender swelling below the ribs on the right side or in the upper and middle part of the belly. This swelling may become red and inflamed and burst like an ordinary abscess, discharging a quantity of thick “matter.” In some instances the abscess opens directly into the belly, thus causing fatal inflammation (*peritonitis*).

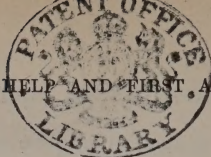
Treatment.—Until professional aid can be obtained the patient should be kept at rest, and on a fluid diet without any stimulants. Hot fomentations or linseed-meal poultices should be applied over the liver. If there be no diarrhoea a moderate

dose of Epsom salts (2 drams) should be given every second or third morning. Symptoms of dysentery should be treated by ipecacuanha (from 5 to 10 grains every four hours), and fever and ague by quinine in 5 grain doses. The patient should be placed under medical treatment as soon as possible.

INTESTINAL WORMS.—Those most frequently met with in man are the round and the flat worm. The *round* worm, resembles very much the common earth worm, but is longer and has a lighter colour. The worm which more frequently attacks seamen, especially those from Baltic ports, is that known as the tape-worm. This is a long and flat creature, made up of a number of white segments or “joints,” which diminish in size towards each end of the worm, and at one end terminate in a thin neck and a small rounded head. The joints become detached from the body of the worm, which usually measures from 20 to 30 inches in length, and are discharged with the stools. These “joints” appear as white flat masses, each about half an inch in length, which may often be seen to move. So long as the head of the worm is retained in the bowels, fresh joints grow from it. The presence of tape-worm in the bowels is due to the eating of measles pork, which has been insufficiently cooked, or taken in a raw state.

Worms, it is stated, cause headache, restlessness, and a voracious appetite, but in most instances the affected person remains quite unaware of their presence until he notices, by chance, a round worm or small white masses in the stools.

Treatment.—The scale of medicines does not contain any remedy for worms. If a large round worm has been discharged, no very active treatment is needed, as probably there may be no more, it being unusual for a person to harbour more than two or three. The man might take half a dram of jalap powder with 5 grains of calomel at night, and a wineglassful of sea water every morning for a few days. Should he be much troubled by the frequent discharge in the stools of pieces of tape-worm, he might take at night a jalap powder (15 grains), and in the morning, fasting, some salicin (15 to 20 grains) in hot tea or coffee, followed, after an interval of three hours, by a full dose (half an ounce) of Epsom salts.



CHAPTER X.

DISEASES OF THE LUNGS, HEART, AND BLOOD-
VESSELS.

Diseases of the Lungs:—DIFFICULTY OF BREATHING—ASTHMA—COLD IN THE CHEST—BRONCHITIS—PLEURISY AND PLEURODYNIA—PNEUMONIA—CONSUMPTION. Diseases of the Heart and Blood-Vessels:—ANEURISM—DROPSY.

DISEASES OF THE LUNGS.

DIFFICULTY OF BREATHING (*Dyspnœa*)—**Causes.**—Shortness of breath occurs in cases of heart and lung disease; as the result of weakness and poorness of the blood, as in scurvy; and in some instances is due simply to such causes as indigestion, excessive smoking, temporary fatigue from violent exercise.

The most serious and urgent cases of dyspnœa are those in which the difficulty of breathing is caused by obstruction of the windpipe. Such obstruction may be accidental, as in scalding of the throat by steam, and when a foreign body, as a piece of bone or a fruit stone, has "gone the wrong way." Diphtheria is a frequent cause in children, but is rare in seamen. In seamen the obstruction is usually due, either to syphilis or to consumption. There is often much difficulty in breathing in cases of swelling of the neck from abscess, erysipelas or slowly growing tumour.

In the first and last-mentioned instances the nature of the case will be readily made out from external appearance, and the statement of the patient. In diphtheria shreds of white membrane, like pulpy rag, will be coughed up, or may be seen attached to the back and sides of the throat. In consumption the obstruction of the windpipe usually comes on late, when the patient is very thin and weak, and has long presented well-marked signs of this disease. In syphilitic obstruction there are usually traces of this affection (dark spots on the skin, thickening of the shin bone, swollen testicle) that can be made out, and the patient will probably own to several attacks of "bad disorder."

The symptoms of dyspnœa, from stoppage of the windpipe, are rapid and noisy breathing, huskiness, and sometimes almost

complete loss of voice; in some cases it increases from time to time, or comes on in violent fits, during which the patient has, as it were, to fight for breath. The face, pale at first, afterwards becomes dusky, and, at last, dark and livid. In severe and fatal cases the blood becomes black and stagnant, and the patient dies from suffocation (asphyxia).

Treatment.—In the treatment of a case of obstruction of the windpipe, the patient should be kept in a warm but airy berth. The chest should be kept warm, and the front of the neck be covered by a sponge, or a handful of tow or cotton wool, frequently wrung out in scalding water. Milk or beef tea should be given at frequent intervals, but, of course, no solid food. Ice, if it can be obtained, should be almost constantly sucked. If the fits of suffocation be very severe, the patient may obtain relief by breathing the steam from a pint of boiling water, to which a teaspoonful of Friar's balsam has been added. A draught of bromide of potassium ($\frac{1}{2}$ dram to 1 oz. of water) may be given every three or four hours. Very little more than this can be done for the relief of difficult breathing from disease of the windpipe, in the absence of professional aid. If the vessel be in port such aid should be obtained without delay, as the patient's life may be saved by a timely operation. For the treatment of dyspnoea caused by a foreign body in the air-passages, see Chapter xxix.

ASTHMA.—An attack of difficult breathing coming on—usually in the early morning—in a person who is subject to fits of asthma, and who very probably often suffers in this way after a voyage, and when land is in sight, may be relieved by a large dose of bromide of potassium (40 or 50 grains in 1 oz. of water), or a mixture of ether and ipecacuanha (see Prescription No. V.) given every three hours, and followed by a small cup of strong coffee.

“A COLD ON THE CHEST” (*Bronchial Catarrh*).—This common and well-known affection needs no special treatment. If the patient be kept warm in his bunk twenty-four or thirty-six hours, be fed on warm milk and broth, and supplied at night with a “strong” glass of whisky and hot water, the troublesome symptoms—feverishness, headache, huskiness, and cough—will be effectually relieved. On the other hand, in spite of much physicing, these symptoms will persist and get worse if he be obliged to work, and be exposed to damp and cold.

BRONCHITIS.—An *acute* attack is in most cases the result of exposure to cold, or of sudden change from heat to cold, or the reverse. Like bronchial catarrh, it often occurs in firemen and stokers.

Symptoms.—The symptoms are—Feverishness, pain over the front of the chest, troublesome cough with expectoration, at first of thin frothy fluid, and, after a time, of thick yellow discharge which hangs together like glue. The breathing is short and difficult, and accompanied by wheezing and gurgling noises.

Treatment.—The patient should be carefully protected from draughts of cold air, and be kept in a warm and dry bunk. If the weather be cold, he should be warmed by hot-water bottles to the feet and to the sides of the body. Turpentine stupes should be applied over the chest two or three times in the day, and, in the intervals, be replaced by fomentations. The bowels should be relieved by an occasional morning draught of Epsom salts (2 drams to a wineglassful of warm water), and a mixture of aromatic spirits of ammonia, chloric ether, and ipecacuanha powder (see Prescription No. VI.) be given every four hours.

PLEURISY AND PLEURODYNIA.—Each lung is enclosed in a thin transparent membrane, called the pleura, which is continued over the inner surface of the ribs so as to form on each side a large closed bag. When inflamed this membrane is sometimes covered by a thick soft deposit, which glues together the opposed surfaces of the lung and ribs, and at other times pours out a thin clear fluid, which collects in the bag, and often accumulates to such an extent as to squeeze the lung into a very small compass, and render it quite useless.

Symptoms.—A sharp “stabbing” pain in the side of the chest may be due either to inflammation of the pleura (pleurisy) or to muscular rheumatism of the wall of the chest (pleurodynia). If the patient be feverish and ill, if there be a troublesome dry cough, and if the pain in the side be fixed to one spot and increase in severity, the case is more likely to be one of pleurisy than of pleurodynia. In the latter affection the general health is not usually much disturbed, and the pain is sometimes worse, sometimes better, and has a tendency to shift.

Treatment.—If the case be one of rheumatic pain, rest in bed and the application of warm flannels or a hot-water bottle to the painful part will give relief in the course of a few hours, and a speedy relapse may be prevented by the application of a flannel bandage. If, on the other hand, the patient should get worse and suffer much from cough and difficulty of breathing, he should be carefully treated, and three or more mustard poultices should be placed in succession over the seat of pain until the skin is slightly blistered, and then be followed by frequent

fomentations. The bowels should be relieved by a dose of Epsom salts every second or third morning, and a dose of a mixture containing ammonia, chloric ether, and ipecacuanha powder (see Prescription No. VI.) be given every four hours. If there be much restlessness at night, the patient may take 10 grains of Dover's powder or a draught of bromide of potassium (half a dram of the bromide to an ounce of water). During the stage of pain and fever the diet should be a fluid one, consisting of beef tea and barley water. Should the patient remain weak and complain much of shortness of breath after the cessation of the more urgent symptoms, and should he be unable to lie on the sound side of the body, the chest should be bandaged with a broad flannel binder, and a small dose of quinine (2 or 3 grains) be given three times in the day. The diet should then consist of small quantities of solid food, and of very little fluid, which should be restricted to about half a tumblerful of weak "whisky and cold water" in the course of the twenty-four hours. If the patient be still suffering from debility and difficulty in breathing at the end of the voyage, professional aid should be obtained without delay.

PNEUMONIA, or inflammation of the lung structure, is a more serious affection than bronchitis or inflammation of the air tubes.

Symptoms.—It usually begins with a fit of shivering, and presents the following symptoms:—High fever (102° to 105°); a hot and dry, and sometimes a dusky skin; short and rapid breathing; a flushed face; short cough, with spitting up of small, sticky, and jelly-like masses mixed with blood; a breaking out of small and painful blisters on the lips. The fever generally subsides on the sixth or seventh day, and is then followed by free sweating and afterwards by slow recovery. In the course of the attack there is more or less delirium, which in drinkers is often very violent. The urine is thick and red.

The most serious cases are those in which the fever is very high, the breathing very rapid, the face dusky, and the patient prostrate and constantly delirious. Old and feeble men, and those who have been hard drinkers, are bad subjects. Subsidence of the fever on the sixth day, with sweating, speedy relief of pain, and relief of coughing, are favourable signs.

Treatment.—The patient should be treated in a warm but well ventilated berth, and be lightly covered. He should not be allowed to get out of his bunk. If there be no alarming symptoms, such as prostration, much difficulty in breathing, and violent delirium, he should be kept on a spare fluid diet, and be

allowed as much lime-juice drink or cold water as he desires. The bowels should be relieved by 5 grains of calomel at night, followed in the morning by a small dose of Epsom salts (2 drams). The chest should be covered by warm flannels, or a thick layer of warm cotton wool or soft tow.

If the skin be very hot and dry and the temperature above 103° , quinine should be given in 5 grain doses every four hours, and an ice-bag or wet cloth may be applied to the head.

If there be much restlessness and delirium, bromide of potassium (1 dram to an ounce of water) may be given in the evening.

If the patient be old and feeble, and shows signs of extreme weakness and prostration, the tongue and lips being dry and dirty, the skin dusky, and the breathing very short, half an ounce of brandy or whisky should be given every three hours in a wineglassful of water.

Precaution.—Under no circumstances should laudanum or Dover's powder, or any preparation containing opium, be given by an unprofessional person to a patient suffering from pneumonia.

CONSUMPTION.—This affection, also commonly known as "decline," and called by medical men phthisis, is a slow and wasting disease caused by the deposit of unsound material—the so-called tubercle—in the lungs and, sooner or later, in other parts of the body, and by subsequent breaking down and destruction of the affected organs.

Symptoms.—The following are the usual symptoms of this disease, which takes, in some cases, a rapid, but most frequently a very slow, course: a hacking cough with discharge of small masses of jelly-like phlegm of a greenish colour, which is often mixed with yellow matter: loss of flesh; bodily weakness, fever (temperature 102° , 103°) in the evening followed by sweating during the night; the appetite bad and capricious; occasional attacks of diarrhoea; the face flushed and the cheeks wasted and drawn in. The patient, if not overworked, improves now and again and becomes hopeful, but, as a rule, the malady is an incurable one, and by a slow process of exhaustion leads to a fatal end.

Treatment.—Although the conditions of a sailor's life on board ship are very unfavourable to a consumptive patient much may be done to relieve troublesome and painful symptoms. The cough may be allayed by giving three or four times in the day $\frac{1}{2}$ a dram of paregoric in an ounce of water, to which, if available, 1 teaspoonful of glycerine may be added. If there be much sweating at night, a draught containing 15 drops of elixir

of vitriol and 10 drops of laudanum may be given every evening. Sharp pains in the chest may be relieved by the application of a mustard poultice or a mustard leaf. Diarrhœa will be checked by giving 1 dram of the diarrhœa powder every four hours. The diet should consist of soup, beef tea, arrowroot, and, if possible, abundance of milk, to which should be added a small daily supply of port.

Precautions.—It is now almost universally acknowledged by medical men that consumption is due to a very minute organism—the tubercle bacillus—which is present in the matter that is coughed up and also in the breath of the patient, and may be carried to other persons. It is really an infectious disease, the spreading of which is much favoured by impure air, damp, and overcrowding. As these conditions so often exist, and indeed may sometimes be unavoidable on board ship, much responsibility is thus thrown on the captain who not only finds that he has a chronic invalid on his hands in the place of an able-bodied seaman, but feels himself morally bound to carry out certain onerous and difficult precautions for the welfare of the rest of the crew.* Such risk and trouble might be prevented to a considerable extent by a thorough and well organised system of medical examination. If only those declared by a responsible medical man to be sound and physically able were allowed to sign articles, there are good reasons to believe that, beyond the saving of expense and inconvenience, much would be done to reduce the present high mortality from consumption amongst seamen.

HEART DISEASES.—The most common form of heart affection, and one frequent amongst seamen, is that in which the valves (see p. 47) are so altered, in consequence of inflammation or overstraining, that the regular flow of blood through the cavities is much disturbed. For instance, the valves between the left auricle and the left ventricle may be either thickened and enlarged, or much shrivelled. In the former case the flow of blood would be obstructed, in the latter the opening would be so free that, in contraction of the walls of the left ventricle, a portion only of the blood would be forced onwards into the arteries, the other portion flowing back, or, as it is called, regurgitating, into the auricle. The whole circulation is thus

* It would certainly be wrong to permit a man suffering from consumption to sleep in the fore-castle. The official German Guide Book for Ships' Captains (*Anleitung zur Gesundheitspflege an Bord von Kauffahrteischiffen*) gives precise directions for the separation of the consumptive patient from others, and for the disinfection of all matter discharged from the lungs.

much disordered. The heart for a time is rendered capable of overcoming the obstruction by increased action and by enlargement of its muscular walls, but, sooner or later, the veins of the lungs and other important organs are engorged with almost stagnant blood, and gradually cease to perform their work.

This form of heart disease is usually the result, in young patients, of rheumatic fever; in the middle-aged and old, of over-straining and irregular living.

Signs.—Although heart disease cannot be proved to exist, unless by a skilled and careful examination of the chest, the following symptoms presented by a thin and weak man, who may have been a hospital inmate, should excite suspicion, and indicate the advisability of rest and considerate treatment:—Palpitation, cough with spitting of thick fluid sometimes mixed with blood, pain in the left side of the chest, and a dusky or livid face. The most marked signs, however, are shortness of breath, which may prevent the patient from lying down, and swelling, from dropsy, of the feet and ankles.

Treatment.—Much can be done to give relief, and to keep in check the progress of this disease. The patient should be kept quiet, and be fed on a light diet of lean meat, fish, and eggs, without beer and spirits. The bowels should be kept freely relieved by an occasional morning draught of cream of tartar or Epsom salts (2 drams of either in water), with $\frac{1}{2}$ dram in either draught of sweet spirits of nitre. Care should be taken to guard against prolonged exposure to cold, sudden change from heat to cold, and overloading of the stomach; excessive use of tobacco ought also to be carefully avoided.

ANEURISM.—Sometimes, in consequence of disease, the coats of an artery become weak at one point, and yield to the pressure of the current of blood, so as to form a bag, which gradually increases in size until it causes death, either by pressing on important parts, or by bursting and so giving rise to profuse bleeding. The bag thus formed, which is called an aneurism, may reach the surface of the body, and become perceptible there as a slowly growing swelling, which moves up and down with every beat of the pulse.

In seamen, a swelling of this kind often occurs in connection with the main trunk of all the arteries (aorta), or with one of the large arteries in the neck. It may be met with also, though less frequently, at the groin and the back of the knee.

Treatment.—The severe symptoms—pain, cough, short breathing—caused by an aneurism of the aorta, may be much relieved by suitable medical treatment, and a like swelling in the

neck or a limb may be effectually cured by an operation. The patient, therefore, should be sent on shore as soon as possible, and whilst at sea should be kept in his bunk day and night, and fed on a very low scale of diet, consisting of not more than 10 ozs. of solid food and $\frac{1}{2}$ pint of water in the twenty-four hours.

DROPSY.—Dropsy is not a disease in itself but a result of some malady by which either the quality of the blood has been altered, or its circulation in the body obstructed. It is due to an escape of the watery parts of the blood, and their gradual accumulation in the tissues. It may occur in cases of extreme weakness or of poverty of the blood, as in scurvy, but is most frequently met with as a result of disease of the heart, kidneys, or liver.

In dropsy from heart disease there is usually much shortness of breath, with cough, palpitation, duskiness of the face, and a weak and irregular pulse.

In kidney disease the patient suffers from weakness and short breathing, and his face in most instances is very pallid.

In disease of the liver there is a peculiar sallow hue of the complexion and sometimes jaundice. The patient is thin and weak, and suffers much from nausea and other symptoms of disordered stomach. The dropsy affects the lower limbs and the belly, but not, as in diseases of the heart and kidney, the face and upper limbs.

Dropsy from heart and kidney disease usually commences in the insteps, the skin being raised and stretched, and yielding when pressed firmly by the finger, so that a dent remains for a short time. The swelling gradually ascends towards the groin and afterwards extends to the rest of the body, the fluid collecting in the cavities of the belly and chest, and in extreme cases causing the face and eyelids to swell. In dropsy from liver disease the fluid collects at first in the belly and afterwards in the feet and legs.

If a patient suffering from extensive dropsy cannot be placed at once under professional treatment, he should be kept at rest, be fed on a light but strengthening diet (soup, beef tea, eggs, milk), be freely purged from time to time by cream of tartar or Epsom salts (2 drams of either), and above all carefully nursed. Attention should be paid by the attendant to the bed-linen, which ought to be kept dry and smooth. The patient's position should be frequently changed, so that bed sores may not be produced by constant pressure on the lower part of the back. Much help may be afforded by fixing a rope to the deck just above the bed so that the patient can raise himself. If

the skin should give way so that the water is constantly discharged, the bed-linen should be protected by macintosh cloth, or by thick layers of pulled oakum which ought to be frequently renewed. To prevent irritation of the skin in such cases strips of clean linen smeared with vaseline should be applied over the moistened surface.

CHAPTER XI.

ABSCESSSES, GANGRENE, ERYSIPELAS, BLOOD-POISONING, LOCK-JAW.

Abscesses:—ACUTE—CHRONIC—TREATMENT. **Mortification or Gangrene:**—TREATMENT. **Erysipelas:**—SYMPTOMS—TREATMENT. **Phlegmonous Erysipelas.** **Surgical Blood-Poisoning:**—SYMPTOMS—TREATMENT. **Lock-jaw or Tetanus:**—SYMPTOMS—TREATMENT.

ABSCESS.—Of this affection there are two forms, the acute or inflamed, and the chronic or “cold” abscess.

Symptoms.—An acute abscess is an inflamed and very painful swelling, which increases rapidly in size until the hot and red skin over it gives way at one or more points, and the fluid contents, consisting of pus or “matter,” are discharged. This swelling is the result of inflammation, which may have been set up by, among many causes, (*a*) diseased glands, such as are often seen in the necks of scrofulous persons; (*b*) by dead bone; (*c*) by a bad tooth causing gum-boil and swelling in the neck; (*d*) by inflamed veins; (*e*) by a blow or wound. The most frequent variety is the acute glandular abscess met with in the armpit or groin as a result, in the former instance, of a poisoned wound in the hand, and, in the latter, of a wounded foot or grazed heel. In a case of abscess near the surface of the body the skin is red and angry, and very tender, and the swelling is soft and elastic. As the skin is about to give way a small greyish patch may be seen marking the spot where the abscess “points.” When the abscess is deep seated there is usually a diffused redness of the skin with intense pain, but no distinct “pointing.”

The general disturbance in cases of abscess will depend very much on the size and depth of the swelling. There is always more or less fever, and the patient is often worn out by pain and loss of sleep.

Treatment.—The treatment of an acute abscess should con-

sist in rest of the inflamed part and constant poulticing with linseed meal. If the pain be severe so as to keep the patient awake at night, an opium pill (5 grains) or a laudanum draught (15 drops to 1 ounce of water) should be given in the evening. If the abscess be a superficial one it will burst sooner or later, and then the patient will at once be much relieved. If the skin be very soft and thin a small puncture might be made with the point of a *clean* lancet, which has just been dipped into a solution of carbolic acid or in boiling water, but in most cases it would be well to let "nature take its own course." After the abscess has burst, and whilst there is a discharge of "matter," the affected part should be dressed with a layer of lint smeared with simple ointment or vaseline, and, over this, a thick pad of fine oakum. Carbolic acid lotion will often cause much irritation of the skin if applied over an abscess. If the discharge be abundant and be kept up for some days, the patient should be well fed, and allowed a liberal supply of port wine or stout.

In cold abscess there is no redness of the skin until just when the swelling is about to burst, and, as a rule, very little pain. The swelling is usually very large and soft. By itself it causes very little discomfort, but, in most instances, is associated with some grave disease of bone—spinal or hip-joint disease—which has already incapacitated the patient. No special or immediate treatment is required in such cases, but the man, if the abscess be a large one, should always be regarded and treated as an invalid, and be placed, as soon as may be convenient, in professional hands.

MORTIFICATION or *gangrene* is death of a part of the body. It is caused in most instances by a cutting off of the supply of blood, by extremes of heat and cold, by poisoned wounds, or by extensive wounding and bruising of a limb. Its most familiar form is that of frost-bite, in which, after prolonged exposure to cold, the tip of the nose, the ear, the fingers or toes, become cold and numb, and then turn quite black. This blackened portion, which in some cases is hard and dry, in others soft and sodden, gradually separates from the rest of the body, leaving an open sore, which heals slowly. Gangrene may spread very rapidly, especially after compound fracture or poisoned wounds, or, as may often be seen in the feet of old and "broken-down" men, it makes but very little progress so long as the affected part is well protected. Another form of gangrene is that known as bed-sores, which are formed over the lower part of the back, or over the hips of a feeble and bed-ridden patient, who is unable to turn over on his side. Large

black patches are formed by the continuous pressure of the mattress, which often spread widely and deeply, and produce abundant discharge of "matter."

Treatment.—In a case of gangrene on board ship, efforts should be made, in the first place, to relieve pain and to keep up the patient's strength and vitality until he can be removed, and, in the second place, to protect the rest of the crew against the offensive smell and other evils which may arise, especially in a warm climate, from the dead and decomposing flesh. The patient should be isolated in an airy and well-ventilated berth, or in a covered boat on deck, and be liberally supplied with soup, beef tea, milk, if it can be obtained, and brandy or stout. He should take, every six hours, an opium pill (5 grains) or a laudanum draught (10 drops in 1 ounce of water) *so long as he is restless*. The mortified part should be frequently cleansed by pouring over it a solution of Condyl's fluid (2 ounces to half a gallon of water) or of carbolic acid (1 ounce to half a gallon of water), and after each cleansing, be covered by fresh layers of linen dipped in sweet oil, and dusted over on the outside by coffee. Over this dressing should be applied thick layers of oakum or tow. The dressings, when removed, should at once be thrown overboard.

ERYSIPELAS.—This is an *infectious* disease, characterised by a spreading redness of the skin, with or without swelling of the tissues beneath, and by much general disturbance and fever. The rash usually starts from a wound or sore, or, as often occurs in erysipelas of the face, from a very small scratch. The disease is more frequent in high than in lower latitudes, and amongst white than black men. It is often due to bad sanitary conditions, and to overcrowding in close and dirty quarters.

Symptoms.—Erysipelas of the face, which is the most common form of the disease, commences usually on the nose, and spreads to the cheeks and forehead, and sometimes to the scalp. The skin is red and swollen, as if scorched by the sun, and is often covered by small blebs, containing, at first, a yellow fluid, and, later, thick "matter." There is high fever (103° to 105°) before and during the spreading of the rash, and the patient is more or less delirious, sometimes being very noisy and violent. The tongue is brown, and the lips and teeth become very dirty. After a few days the rash ceases to spread, and rapidly dies away, leaving the affected skin covered partly by thin scales, partly by thick scabs.

Simple erysipelas of the skin is much less frequent on other parts of the body. There it most commonly begins near a healing

wound or an old sore. The rash at first is indistinct, and looks as if it had been caused by the rubbing of clothes or some other irritation, but it may be known by its spreading far and wide over the surface of the limb, and by the feverish and depressed state of the patient. As in erysipelas of the face, the temperature of the body is very high (102° to 104°). As it spreads less rapidly and over a larger surface, erysipelas usually lasts longer on the body or one of the limbs than on the face. As the rash disappears the skin becomes soft and delicate, and is covered by fine scales. It is often followed at some part of the affected limb, by one or more superficial abscesses.

Treatment.—The red and inflamed surface should be frequently dusted over with fine flour and be covered by a layer of clean cotton wool, or, this failing, tow. If the face be the affected part, the cotton wool should be made into a mask, with holes for the eyes, mouth, and nostrils. The bowels should be well opened by a full dose of Epsom salts, but beyond this no medicine need be given. The treatment should consist mainly in nourishing the patient by an abundance of milk and beef tea, given at frequent intervals, but in small quantities at a time. As there is usually some delirium, and often much restlessness and a desire to get up, the patient ought not to be left alone, although, by reason of the infectious nature of his affection, he should be kept apart from the rest of the working crew.

PHLEGMONOUS ERYSIPELAS.—There is another and much more severe form of erysipelas. This is often met with in the upper limb after a poisoned wound of the hand or one of the fingers. The limb swells—often to double its size—and becomes very painful. The skin at first is pale, much stretched, and very firm; afterwards it becomes red and soft. Black patches may form here and there, which break down into openings, from which there is an abundant discharge of “matter” or pus, mixed with large yellow shreds. There is often much destruction and sloughing of skin, and large open sores are formed, which heal very slowly.

Treatment.—Pain may be relieved by giving an opium pill (5 grains) or 10 drops of laudanum, in water, every six hours, and the strength of the patient maintained by giving milk, beef tea, and whatever fluid nourishment he can take, with whisky or brandy. The swollen limb should at first be frequently fomented by flannel wrung out in scalding water, and afterwards, when openings have formed and there is much discharge, be dressed with broad pieces of linen dipped in carbolic acid solution (2 drams to a pint of water) or crimson fluid, over which

should be fixed by bandages thick layers of oakum. The dressings should be changed frequently, and when removed be at once destroyed.

If the skin be very soft at any part, and evidently undermined by purulent matter, a small cut may be made into it with a lancet. All black patches should be treated in a like manner, as further destruction of the skin may be thus prevented.

In every case of erysipelas, care should be taken to destroy the dressings after they have been removed, and to disinfect the patient's surroundings (see *Disinfection*, pp. 19, 20).

SURGICAL BLOOD-POISONING.—Anyone affected with an open wound or sore, or an abscess, may under unhealthy or insanitary conditions suffer from serious general disturbance, the most prominent symptoms of this being violent and repeated shivering, high fever, and extreme weakness with rapid loss of flesh. The cause of such disturbance, as of other bad results of wounds, erysipelas local inflammation and lock-jaw for instance, is now believed to be the action of microbes or germs. The blood, it is assumed, is poisoned either by the products of putrefaction or decomposition at the wounded surface, or through the absorption of one or more special organisms, which, like the germs of scarlet and typhoid fever, and of cholera, are each capable of producing a distinct disease. There are many forms of surgical blood-poisoning, which vary from a transient attack of fever and mild constitutional disturbance to a very severe and rapidly fatal attack resembling intense shock. In one form, which is known as pyæmia, there is a tendency to the formation of abscesses on different parts of the body, especially in joints. It was formerly believed that these affections occurred only in hospitals, but there can be no doubt that they are just as likely to be met with wherever many persons live together in an ill-ventilated and dirty place. The chief and direct cause, however, is dirty dressing or free exposure of a wound or sore. Since the general adoption in surgical practice of the antiseptic method, and a very scrupulous attention to cleanliness in dealing with raw surfaces, pyæmia and allied forms of blood-poisoning have been almost completely abolished in hospitals, and it is only where such precautions have been disregarded, either through necessity or through carelessness, that these terrible affections still occur.

Pyæmia is the best known and perhaps the most frequent form of surgical blood-poisoning.

Symptoms.—It usually begins with a sudden attack of severe rigor or shivering, followed, as in fever and ague, by exhausting

perspiration. This attack is followed by others, which, unlike those of fever and ague, occur at irregular intervals, and may be repeated two or three times in the course of a day. The tongue soon becomes dry and brown, and the skin rough, and of a dirty yellowish colour. The patient loses flesh very rapidly, and becomes very prostrate. In many cases there is obstinate vomiting. A frequent complication is inflammation of one or both lungs, indicated by pain in the chest, increased frequency of breathing, and expectoration of thick dark-coloured phlegm. The most marked feature in an attack of pyæmia is the appearance of large abscesses in different parts of the body. These form suddenly, and increase rapidly in size, and are usually very painful when touched. They are met with most frequently in the knees and shoulders, and on the groin, back, thigh, and calf of the leg. If the temperature be regularly taken with a clinical thermometer in the armpit or mouth it will be found very erratic, being sometimes higher in the morning than in the evening, and now and then suddenly rising to a high point (103° or 104°), and afterwards remaining relatively low (99° or 100°) for two or three days.

This affection is a very serious one, and usually fatal. The worst cases are those in which the attacks of shivering are frequently repeated, the abscesses large and numerous, and the patient delirious.

Treatment.—It is very desirable in the treatment of pyæmia to remove the patient from the rest of the crew, and to keep him in a current of fresh air. If there be any open wound or sore, it should be cleansed with a solution of carbolic acid (2 drams to 1 pint of water), and afterwards covered by some antiseptic gauze, or iodoform and dry lint. The dressing should be renewed morning and evening, and the old and foul dressing destroyed at once. Medicine can do no good, and might do harm by exciting nausea and sickness. The patient's strength should be supported by small and frequently repeated supplies of brandy, wine (port or burgundy), strong beef tea, milk, and eggs. If a large abscess be noticed on the surface of the body, endeavour should be made to ward off pressure by pillows. A pyæmic abscess should never be opened unless the skin be red and very tender. As soon as the vessel reaches port medical aid should be obtained, or the patient be carefully removed to a hospital.

LOCK-JAW or TETANUS.—This very serious disease, which consists in painful cramps extending from the throat and neck to the whole body, is much more frequent in hot than in temperate and cold climates, and amongst blacks, more particu-

larly negroes, than white men. Among places in which it occurs with unusual frequency may be mentioned Brazil, the West Indies, Senegambia, and Bombay. It may occur without injury, but it usually follows a wound, which, in many instances, is but a mere scratch. It is most common during sudden changes of weather from heat to cold. There are good grounds for belief that it is due to the action of a special germ or bacillus, which exists in earth and street dust. This would account for the fact that lock-jaw is very frequent amongst soldiers who, during a campaign, have to sleep on the ground, and amongst negroes who sleep out of doors, and whose uncovered legs and feet are so often attacked and wounded by insects.

Symptoms.—The first signs of lock-jaw usually appear within the first week after the injury, as a rule earlier in hot than in cold countries. The sooner the disease presents itself the more serious it is; if noticed before the tenth day it is almost invariably fatal, if delayed until the third week the symptoms are milder and much less unfavourable.

The disease usually begins with stiffness of the neck, and difficulty in swallowing. The lower jaw soon becomes set so that the patient cannot open his mouth, and, at the same time, there is a peculiar change in the features, the lips being drawn into a fixed smile. The body is next attacked, the breathing being rapid, and the front of the belly painful and very hard, feeling like a board. As the lower limbs are affected they become painful and very rigid. The patient now suffers from frequently repeated attacks of cramp, which rapidly increase in severity, the body, from time to time, being bent backwards, so that the patient rests on his head and heels, or, though less frequently, he is twisted sideways. There is often so much difficulty in swallowing that the saliva flows constantly from the mouth. In the course of a violent fit of general spasm the tongue may be caught between the jaws and bitten. The patient, who has remained conscious through all this suffering, is, in most instances, suddenly suffocated during a severe convulsive attack.

Treatment.—All that can be done in a case of well-marked lock-jaw is to give some little relief. The patient should be kept in a secluded place, as any noise is apt to cause excitement, and to render the muscular spasms worse. Bromide of potassium in 1 dram doses should be given every two or three hours. Milk, beef tea, and brandy should be given frequently in small quantities. If, as often happens, the patient is unable to take any nourishment by the mouth, a mixture of beef tea and brandy should be gently injected into the lower bowel by the enema syringe (see Chapter xxxi.).



CHAPTER XII.

INJURIES FROM HEAT AND COLD.

Burns and Scalds:—TREATMENT. Frost-Bite:—TREATMENT. Lightning Stroke.

BURNS AND SCALDS.—Burns are caused by flame and heated solids, scalds by hot fluids and steam. The most severe of these injuries is the scalding produced by a sudden escape of steam, as in boiler explosions. The heated vapour not only causes extensive destruction of the surface of the body, but also attacks the air passages and lungs.

In the mildest form of burn or scald the skin is simply reddened or scorched. In more severe cases the red and inflamed skin is covered by blisters, which, in scalding, are often very large. The most severe forms are those of complete destruction or charring, which may involve only the skin, or extend deeply into the flesh, or reduce the whole thickness of a limb to a black mass. The structures thus destroyed must become loose and be separated from the body before the burnt part can heal.

As a rule, the severity of a burn or scald depends not so much on the depth to which it reaches as on the extent of the surface of skin that has been subjected to heat. A burnt person may recover after complete destruction of a hand or foot, but death will almost invariably result from the mere scorching of more than one-third of the surface of the body.

Superficial burns of the limbs are less serious than those of the scalp, and of the front of the chest and belly. Cases of scalding, in which the clothes are saturated with the heated fluid, are usually severe, as some time must elapse before the surface can be cooled by exposure to air. Thick fluids, such as hot pitch, cause deeper and more troublesome sores than a thinner fluid, such as water.

A person who has been severely burned or scalded has many dangers to overcome. Death may occur very soon from shock, the intensity of which is often increased by the fright excited by the accident. In many cases, especially those in which there is extensive blistering, the pain is so intense as to cause extreme prostration. There is always a tendency in cases of bad burn or scald to congestion of the brain, lungs, and intestines, and to

consequent delirium, difficulty of breathing with cough, and diarrhœa. During the separation of the masses of charred tissue (sloughs) there is a profuse and exhausting discharge of purulent matter. Whilst this process is going on, and also during the healing of the large open sores which are formed, the patient is exposed to the risks of erysipelas, lock-jaw, and blood-poisoning. Finally, after complete healing of the sores produced by a deep burn, the scars may by their shrinking cause much deformity, and hinder to a serious degree the mobility and the usefulness of the injured parts.

“First-Aid” Treatment.—A person whose clothing has caught fire, and is in flames, should be pushed down and rolled over on the floor. If there be any covering at hand (a piece of canvas, matting or rug, thick coat, or tablecloth), this should be first thrown round the burning person, who ought then to be laid flat, and rolled over until the flames are extinguished. If the accident has occurred under cover, and a third person be present, orders should be given for doors and ports to be closed, so that any draught of air may be thus cut off. The smoking clothes should then be *freely* drenched with cold water. If the case be one of extensive scalding by hot fluid or steam, all the clothing should be saturated with cold water.

Treatment.—The flames having been put out and the steaming clothes cooled, these should be removed without any delay. Whilst this is being done the patient should be kept warm by a blanket, or be placed in a tepid bath, if such can be promptly and readily prepared. The clothing should be cut away with a *sharp* knife or scissors, not pulled off. This should be done rapidly, but yet gently and carefully, and without an attempt to save any of the garments. If any portion of the clothing stick to the skin, it should be cut away from the rest and be left. Care must be taken not to tear any blisters. When a portion of the body or a limb has been thus laid bare, it should be covered by the blanket before the clothing is removed from another part. Whilst all this is being done, a cup of strong tea or coffee or some brandy and hot water should be given to the patient.

The burnt or scalded surfaces should then be covered by pieces of clean linen dipped in oil (sweet oil, lamp oil, machine oil, melted fat or lard). One of the best applications for a burn is carron oil, which is a mixture of equal parts of linseed oil and lime water (p. 38). If there be not enough oil or linen to cover the whole of the burnt surfaces, those parts of the skin which are least injured, and only reddened or scorched, may be dusted over with flour or starch. The burnt regions of the body should

afterwards be covered by thick layers of cotton wool, cotton waste such as is used in the engine room, or tow. These should be kept in place by applying a bandage in the case of a burnt limb, and a long towel or a broad piece of linen if the body has been burnt.

The patient should be kept well covered by warm blankets until the doctor arrives, and *warm* drinks (coffee, tea, or milk and brandy and water) should be frequently given. If much of the surface of the body has been injured, there will probably be intense thirst.

In the subsequent treatment, if professional help cannot be obtained, the patient's strength, for the first three or four days, should be supported by strong beef tea and frequent doses of sal volatile (1 teaspoonful to a wineglassful of water). If the pain be very severe, half a dram of bromide of potassium should be added to each dose. If the weather be warm the patient should, if it be possible, be kept in a small made-up tent on deck. The first dressings should not be changed until the discharge has come through and they begin to smell. Then they should be carefully removed, and the injured surfaces be cleaned by squeezing over them a clean sponge or a handful of cotton wool dipped in a weak solution of carbolic acid (1 teaspoonful to $\frac{1}{2}$ pint of warm water). If there be any large blisters, each of these should be pricked with the point of a needle, so that the fluid may gradually flow away, and the skin over the blister fall down and cover the raw parts beneath. Similar dressings of linen steeped in oil should be applied again and again, until the destroyed parts begin to loosen, and there is much discharge. Then the burnt surface should be covered by linen dipped in crimson fluid, and, over this, by thick layers of oakum. During this stage the patient should be well nourished. It would be well *not* to give any purging medicine whilst treating a bad burn, and should there be any diarrhoea, this should not be stopped unless it be very severe; in which case 5 grains of the diarrhoea powder, or 10 drops of elixir of vitriol, with the same quantity of laudanum, might be given two or three times daily.

Slight and not very extensive burns and scalds should be dressed with simple ointment or vaseline, the raw surface being frequently cleansed with warm water, and kept at rest and free from irritation.

FROST-BITE.—After prolonged exposure of a naked part of the body—as the nose, the hands, or bare feet—to intense cold, the skin becomes at first red and tender, next hard, white,

and numb, and at last turns black and mortifies. Frost-bite, formerly so common in Lascar crews, is now rarely observed in British ships. The parts most frequently attacked are the toes and fingers. As those affected are for the most part coloured men, it is difficult to make out the extent of the mischief, and to know whether mortification has really occurred. If the skin be cold, hard, and shrivelled, and there is no sensation when the affected part is pinched, the vitality of the soft parts has very probably been destroyed.

Treatment.—In the early stage of frost-bite, when the skin is tender and mottled, the inflamed part should be rubbed for about half an hour with sponges dipped into cold water, or with snow, if there be any on the deck, next gradually warmed, and finally enclosed in dry flannel or cotton wool. Often, after an extensive surface has been found quite cold and livid, and apparently dead, the whole or much of the frozen part has been saved through great care having been taken in *gradually* restoring warmth, and in resting the part so as to prevent any inflammation.

If any part has been killed by frost-bite the black and mortified skin should be covered by pieces of lint or linen dipped in sweet oil, and over these, by a thick layer of oakum. No attempt should be made to remove any dead and partially detached toe or finger. If the whole foot or a large portion of a limb has mortified, it should be frequently dressed with oiled lint and oakum, and, until the patient can be placed under professional treatment, he should be supported by soup, strong beef tea, and milk; laudanum (10 drops to a wineglassful of water) being given morning and night to relieve any severe pain.

LIGHTNING STROKE.—The injuries caused by lightning vary much in extent and character in different cases, but almost always cause more or less insensibility. In the more severe instances the injured person may be killed at once, or become suddenly collapsed and unconscious. The body may be much burnt and mutilated, or—and this occurs even in fatal cases—there may be no external mark of injury. In some instances, probably, the shock is due rather to alarm than to the action of lightning.

The patient should be treated as if suffering from ordinary shock, by stimulants (brandy and hot water, hot coffee, or tea), by the application of warmth to the surface of the body (warmed flannels and mustard poulticing over the belly, or hot-water bottles to the feet and to the sides of the body), and, in very severe cases, by artificial respiration (see Chapter xxix.). Burns and wounds caused by lightning will require the usual treatment of such injuries caused in other ways.



CHAPTER XIII.

WOUNDS.

Wounds:—DIFFERENT KINDS—MODES OF HEALING. Antiseptic
Surgery:—ANTISEPTICS—MODES OF TREATMENT.

WOUNDS.—Surgeons recognise several kinds of wounds. Those cleanly cut by a sharp instrument are called *incised* wounds; stabs, whether with a sharp or blunt ended instrument, are called *punctured* wounds; and those wounds in which the skin is torn, are called *lacerated*. When the skin and flesh are not only cut but also much bruised and crushed, the wound is a *contused* one.

An incised wound usually heals more readily and promptly than a contused or lacerated one. The edges, if they keep together and are not disturbed, soon unite, and the wound closes without discharge and without any irritation of the surrounding skin. *This is called union by the first intention.*

In contused and lacerated wounds, and in wounds that are much disturbed by exercise of the injured part, or by the rubbing of clothes or dirty dressings, the edges often separate and expose a raw and discharging surface, which heals slowly and forms a scar. This is called *healing by granulation*.

In healing by primary intention the wounded part is speedily restored to its natural condition. The gap in the skin being closed, the deep parts of the wound are secluded from the air and all causes of irritation. On the other hand, if the wound remains open it is liable to be irritated or poisoned, and the patient is exposed to the risks not only of inflammation about the wounded part, but also to those of abscess, erysipelas, and blood-poisoning.

ANTISEPTIC SURGERY.—A knowledge of this subject, even though elementary, will prove useful to those who may be called on, in the absence of a surgeon, to afford help to a wounded man. By such knowledge they will certainly be taught to avoid doing what is hurtful and wrong.

Common experience teaches that organic matter, that is to say, animal or vegetable matter, when exposed to the air after

death undergoes certain changes. The raw surface of a sliced apple or potato, to take a simple instance, will be covered by mould and become soft and discoloured. A piece of fresh meat if exposed to air and warmth will, sooner or later, cease to be fresh, and become black and foul, and unfit for use as food.

It must be well known to the captain of every ocean-going vessel that meat, vegetables, and fruit carefully stored in a tin case from which air has been driven by steam, and which is then closed at every point, may be kept sweet and fresh and suitable for consumption for many months. It is known, also, that if these articles of food be again exposed, or that if they have been badly "tinned," they will soon become putrid or will ferment.

It is now generally admitted that putrefaction in dead animal and vegetable matter is due to the action of very minute living bodies which abound in the air, and settle down like visible dust on every object. These bodies which are called *germs*, *microbes*, or *bacteria*, when they fall on suitable soil increase in number with great rapidity, and as they feed on the meat or fruit they produce the changes in its chemical composition that are so unpleasantly revealed by taste and smell. Although so small that they cannot be seen, except under a good microscope, these germs vary in nature and properties, some attacking one kind of organic substance, some another. Like higher and larger living bodies they thrive in warmth, and are killed by extreme heat and cold. They are also destroyed or poisoned by certain chemical agents, the best known and probably the most active of which are carbolic acid, corrosive sublimate, and chlorine gas.

As with dead, so with living flesh. The latter when exposed to the air, as in an open wound, also becomes a resting place for germs, some of which are probably harmless and inert, whilst others by feeding there and increasing rapidly in number set up decomposition and cause inflammation and the formation of pus or "matter." Other germs, again, of a more serious nature, which exist in the bad air of crowded hospitals, or of close and dirty rooms, are absorbed into the blood and give rise to erysipelas and blood-poisoning. All the mischief attending an open wound is due, there is every reason to believe, to the contact of minute germs. Hence the important distinction between a *simple* and a *compound* fracture; between a case of broken bone in which the skin remains intact, and a case in which the skin is wounded and the broken bone and torn flesh are exposed. In the former injury there is no inflammation,

no fever, and very little, if any, general disturbance; in the latter, unless it be properly treated, the patient is subject to serious dangers both local and general.

It is not by the air only that an open wound is thus poisoned. Germs as well as unclean matter may be carried on the wounding instrument, on dirty sponges or unsuitable dressing, and on the fingers of the attendant or patient.

On these assumptions—viz., that inflammation of an open wound and associated fever and other disturbances of the whole system are always or almost always caused by minute living organisms or germs introduced from without the body, and that these germs may be destroyed or poisoned either before or soon after their entrance into the wound—is based the “Antiseptic System” which, since its introduction by Sir Joseph Lister in 1867, has done so much to save life and prevent suffering.

Substances which destroy germs are called **antiseptics** or **disinfectants**. Happily these are very numerous, and many of them are in common use for other purposes and may be readily obtained. Those most favoured by surgeons are carbolic acid, corrosive sublimate, cyanide of mercury, salicylic acid, chloride of zinc, iodoform. The following articles contained in the Scale of Medicines possess antiseptic properties in varying degrees:—Carbolic acid, liquor ammonia, iodoform, sulphur ointment, salicin, turpentine liniment, crimson fluid, Friar’s balsam.

The following is a list of articles in common use, any one of which would serve as an antiseptic in case of need:—Turpentine, alcohol in the form of spirits, strong wines or methylated spirits of wine, treacle or golden syrup or a syrup of white sugar, glycerine, powdered charcoal, and sulphur.* To these may be added oil of mustard, diluted with 50 or 60 parts of water. The simplest and, perhaps, the most efficient agent is boiling water or water that has just been boiled. Clean cotton wool, oakum, or jute will be found good protective dressings.

In the performance of any cutting operation the modern surgeon and his assistants pay most careful attention to the principles of the antiseptic method, and exercise the utmost caution in their preparations with the aim of preventing infection or fouling of the wound. Their hands and all their instruments, and also the patient’s skin at the seat of operation, are thoroughly cleansed and disinfected. From time to time the wound is washed out with antiseptic fluid. At the end of the operation, and after bleeding has been stopped, the raw surfaces are again carefully

* *A Surgical Handbook*, by Caird and Cathcart, p. 163.

disinfected, and the edges of the wound are stitched together, elastic tubing being inserted at one or more points to prevent any blood or discharge from collecting under the skin. The thread used for tying the arteries and those used as stitches are all carefully disinfected. Finally, the wound and the parts around are covered by a thick layer of antiseptic dressing, which, if it keep dry and unstained, is often allowed to remain untouched for many days.

In dealing with an open wound, which is the result of injury, and which has already been exposed to the air and other sources of contamination, the first object of the surgeon is to thoroughly cleanse the raw surfaces, and to destroy all germs that may have already gained entrance. After the bleeding has been stopped the wound is carefully syringed out with a solution of carbolic acid or some other antiseptic fluid, and the surrounding skin also is cleansed in a like manner. The wound is then closed by stitches and covered by thick and wide layers of antiseptic dressing.

In the "first aid" and non-professional treatment of a recent wound the chief endeavour should be to remove or keep away from the open surface every source of impurity. The clothing should be at once removed from the seat of injury. No sponge or handkerchief or dry linen of any kind should be applied, nor should the wound be touched with a dirty finger.

How to Treat a Wound.—The first step to take is to *stop bleeding*. Unless any large vessel has been divided the flow of blood will soon cease by itself, or may be arrested by slight pressure. If there be a slow oozing of blood from all parts of the wound a strip of clean linen dipped in hot water should be applied over the raw surface. Water that has just been boiled stops bleeding and destroys germs. *It is strongly urged that in cases of open wound no styptic or special substance for stopping the bleeding be used.* For this purpose some use tincture of steel, others matico and spider's web. If the bleeding be violent such agents are useless, if it be slight they are quite unnecessary, and in all cases they do much more harm than good by irritating the wound and making it foul and sloughy. (For the *arrest of violent bleeding*, see Chapter xv.).

When the bleeding has ceased the skin around the wound should be carefully cleansed, first with soap and warm water, and, afterwards, with a solution of carbolic acid (2 drams of the acid to 10 ounces of water). Some of the same solution, into which the hands of the attendant should be dipped before he touches the wounded part, should be applied by means of a

glass syringe over the whole of the wound. This should be done thoroughly.

If the wound be a small one, and situated on the body or one of the limbs, it may now be covered by lint well saturated with Friar's balsam, and over this by a thick and broad layer of cotton wool or oakum, the dressing being kept in its place by plaster and a bandage.

Although, in the absence of a medical man, it would be better in most instances to leave a wound open, and to allow it to heal up from the bottom, it will be found advisable, when the cut is a long one, and its edges gape widely — especially

when it is situated on the face or neck—to close a portion of the gap by stitching, the middle of the wound being left open. A straight or slightly curved needle, threaded with thick cotton or silk, should be thrust, first through the thickness of the skin on one side of the wound, at a distance of about a quarter of an inch from the cut edge, and then in a direction from the wound outwards, through the skin on the opposite side. The edges of the wound being then gently pressed together,

the thread is tied in a reef-knot. If it be thought necessary to apply two or more stitches, the distance between them should be about a quarter of an inch in the face, and half an inch elsewhere. *The needle and thread, just before they are used, should be purified by being kept for about five minutes in boiling water.* The wound should then be “dusted” with iodoform, and covered by lint dipped in Friar's balsam, or, far better, if such be at hand, by some antiseptic gauze (carbolic, cyanide, iodoform, or sal-alembroth). The wounded part should finally be covered by thick layers of cotton wool or oakum.

In every case of large or deep wound, the patient should be kept on his back for a few days, and, unless enfeebled through

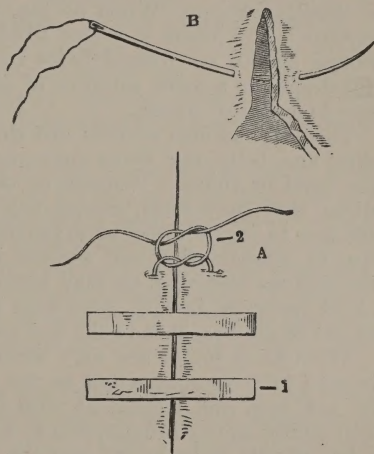


Fig. 18.—Sutures.—A, 1, Strip of plaster; 2, Suture. B, Curved surgical needle.

bleeding, be put on a spare diet. If the dressings keep quite dry, and the patient remains free from fever, and from pain in the wounded part, the wound should be left covered and undisturbed for the first three days, and then, if it be looking well, be dressed again in the same way.

If, when the wound is uncovered, the surrounding skin be found red and "angry," the stitches should be carefully cut and pulled away, and the whole of the inflamed part be dressed every two or three hours with a lotion composed of 6 ounces of spirits of wine, half an ounce of Goulard's extract, and 12 ounces of distilled water. When all signs of inflammation have disappeared, and there is a free discharge of pus or matter, the wound should be dressed twice in the twenty-four hours with lint dipped in a weak solution of carbolic acid (2 drams of the acid to a pint of water).

The most serious wounds are those which penetrate into the chest and belly, and those communicating with broken bone in the head or limbs. Wounds of the scalp and hand, however slight they may seem, should not be neglected, as the former are apt to be followed by erysipelas, and the latter often give rise to inflammation and abscess in the forearm. Wounds of the face are alarming, as they bleed freely at first. The flow of blood, however, in such cases soon stops, unless the main artery or one of the branches to the lips be cut (see *Frontispiece*).

Wounds of joints are very serious injuries, especially if the injured joint be a large one, as the knee or elbow. If the case be not seen and treated at once by a medical man, the joint will almost surely inflame, and in a short time be converted into a bag of pus or "matter," and the patient, if he should survive a long series of troubles, will be much crippled in consequence of stiffness and wasting of the injured limb. In every case of wound near the joint, and whenever there is a discharge of a sticky fluid, like white of egg, the patient should be kept in his bunk, the injured limb be fixed securely on a splint, and the wound and the adjacent joint kept cool by the constant application of ice, or, failing this, cold sea water.

"First Aid" and Extemporary Treatment of Wounds.—The wounded part having been *freely* exposed, not by taking off any of the clothing, but by slitting up the seams of the trousers or sleeves, by cutting undergarments, and by unbuttoning the garments on the body, endeavour should be made to carry out the following measures of immediate relief:—

To Arrest the Bleeding.—As has been stated above, in most cases the flow of blood will soon stop by itself. If the bleeding be very

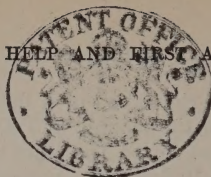
rapid and profuse, and the blood of a bright red colour, pressure should be made on the wound, and a tourniquet or handkerchief be tightly bound round the limb above the wound. If there be a slow but steady flow from several parts of the wound, this may be stopped by the application of hot water.

To Clean the Skin around the Wound.—The blood and loose dirt should be removed by washing the surface with *clean* warm water, into which some carbolic acid has been poured (about 2 teaspoonfuls to a pint). No dirty sponge or rag should be used for this purpose, but either a piece of clean lint or a small ball of oakum. If there be time, the skin should afterwards be washed over with spirits of wine. If any foreign object, as a piece of wool or a rag of clothing, be fixed in the wound, it would be well to let it remain, as any attempt at removal might cause fresh bleeding, and loss of time in removing the patient. Care should also be taken not to remove or disturb any clotted blood in the wound.

To Replace the Edges of the Wound as far as possible in their Natural Position.—If the edges of the wound gape widely, or are much torn, so that a large flap is turned over with its raw surface freely exposed, the large open surface should be covered over by replacing any partially detached portions of skin and flesh, and by gently pressing the edges of the wound together. Very little can be done in this respect by using sticking plaster, as this gets but very slight hold on the skin on account of the bleeding, and soon becomes loose.

To Cover the Wound.—A folded piece of clean lint, or a clean linen handkerchief, wrung out in boiling water or dipped in a solution of carbolic acid (4 drams to 1 pint of water), should be applied over the wound and the surrounding skin. This simple dressing should be covered by a thick layer of cotton wool or soft oakum, and over all a clean bandage or a broad strip of clean canvas should be firmly applied.

Before sending the man on shore a sling should be applied in case of wound of the arm or forearm, and if the lower limb be wounded, the two legs should be bound together by a bandage or folded handkerchief.



CHAPTER XIV.

GUNSHOT WOUNDS, BITES AND STINGS BY ANIMALS.

Gunshot Wounds:—TREATMENT. Bites and Stings:—MOSQUITOES—TICKS—JIGGER—WASPS—BEES—SPIDERS—SCORPIONS AND CENTIPEDES—SNAKE BITES—PRICKS FROM FISH—BITES OR SCRATCHES FROM DOMESTIC ANIMALS—HYDROPHOBIA.

GUNSHOT WOUNDS.

THE most severe forms of gunshot injury in civil life are those caused by a revolver bullet or by a large mass of shot discharged close to the body. The danger of such wounds is due to the depth of the injury, and to the destruction of the soft parts along the track of the projectile. A long wound is formed, the walls of which inflame and slough, and remain for a long time the source of an abundant discharge of foul fluid. Increased irritation is often set up by the embedded bullet and pieces of clothing. The bullet is a source of danger so long as it remains in the body, hence the importance of removing it if this can be done with certainty and without danger.

The chief risk in cases of gunshot wound in which the patient survives for a time is bleeding. Unless some large vessel is divided at the moment, there is not, as a rule, much loss of blood at first, but near the end of the first week there is often free bleeding, in consequence of the sloughing and perforation of some important artery. The old form of round bullet causes much less damage than a conical bullet; the former may glance off a bone and not penetrate deeply, whilst the latter will keep its course, crushing and tearing all the tissues that it meets with in its course.

Wounds caused by gunshot injury should be treated in the first instance like ordinary wounds. The wound and the skin around it should be thoroughly cleansed by carbolic acid lotion (2 drams of acid to half a pint of water), afterwards dusted thickly with iodoform, and finally covered by a thick layer of cotton wool or fine oakum.

If there be free bleeding from the wound, an attempt should be made to stop the flow of blood by firm pressure over the wound, or, if the arm or lower limb has been injured, by apply-

ing for a short time a tourniquet or a tight band above the wound.

If the patient has been shot in the chest, he should be made to lie on the injured side, the wound having been cleaned with carbolic acid lotion, and covered by a piece of lint dipped in this fluid.

If the belly has been wounded, the patient should lie on his back with his legs drawn up.

Gunshot wounds of the head, in most instances, cause death at once. If the patient should survive the immediate effects of the injury, it would be right to shave the head and to apply ice in a bag or a bladder over the injured part.

No attempt should be made to remove the bullet or any embedded clothing, unless either be very superficial and freely exposed to view.

If there be much shock soon after the injury, and the patient become very pallid and prostrate, he should not be moved, but be kept quiet on his back, and be covered by thick rugs and canvas. Some brandy with hot water may be given, unless the belly has been injured, when nothing should be allowed save small pieces of ice or a very little cold water.

In every severe case of gunshot wound the patient, for the first two weeks, should be kept on a low and fluid diet. After this interval, if the wound remain open and discharge freely, he should be fed more generously on strong soups and beef tea, together with port wine or stout.

BITES AND STINGS OF VENOMOUS INSECTS AND REPTILES.

Mosquitoes.—These insects give much trouble in warm countries, as they prevent sleep at night by their noise, and produce painful pimples with much swelling of the surrounding skin. They attack the parts that are usually exposed in bed—the forehead, face, forearms, and the backs of the hands and wrists. The best means hitherto devised for warding off these insects is the inunction of the exposed parts with a mixture of carbolic acid and sweet oil (1 part of pure acid to 20 parts of oil).

Ticks.—These insects, which work their way under the skin and there cause much itching, are among the great pests of some tropical regions, and abound in enormous numbers in Equatorial Africa. According to Surgeon-Major Parke,* the free use of carbolic soap in washing, and subsequent inunction with carbolic oil, will go a long way to protect the exposed surfaces from these

* Parke, *Guide to Health in Africa*, p. 123.

attacks. When noticed in the skin they should be at once dislodged, the fine point of a narrow-bladed knife being the best instrument for this purpose.

The Jigger or Sand Flea is met with in North and Equatorial Africa, and in Brazil and the West Indies. It swarms in sand, and attacks those who walk with bare feet by the sea shore. This pest is a small brown flea, the female of which burrows under the skin of the toes or the toe-nails, and, enlarging there, forms a painful swelling which, if allowed to remain, will break down into a troublesome abscess. The distended flea should be exposed to view by enlarging the small opening it has made in the skin, with the point of a clean needle, and then very carefully removed. If it be torn or pricked, the eggs by which it is distended will escape into the wound and cause further irritation. After the insect has been removed, the small wound should be well washed out with a strong solution of carbolic acid (1 part of the acid to 10 parts of water), applied by a small piece of sponge or a small syringe. If there be several open sores on one or both feet, the patient should rest, and apply to the affected skin a lotion of carbolic acid (2 drams to half a pint of water), or, if this should increase the irritation, vaseline spread on lint.

Spiders.—Although the bites of these creatures are not generally painful or serious, there is in New Zealand a variety called the katipo or poison spider, the sting of which causes much swelling, and collapse and a low state of health lasting for several weeks. In such cases a light ligature should be applied above the wound, and ammonia or brandy be freely administered to the patient.

Scorpions and Centipedes.—The scorpion wounds with its tail, the centipede with its mouth. The stings of the former are very painful, and often cause much general disturbance (faintness, vomiting), but are rarely fatal. The bite of a large centipede is also very painful, but is seldom followed by such severe general symptoms as those caused by the sting of a scorpion. In a case of scorpion wound a tight ligature should be applied above the seat of injury, if this be in a limb, and the wound itself be freely dusted with ipecacuanha powder or covered by a piece of linen dipped in sal volatile or vinegar. Ammonia (10 drops of spirits of hartshorn in 1 ounce of milk or cold water) should be given every half hour whilst the patient is faint and depressed. If the wounded part become much inflamed fomentations or linseed meal poultices should be applied.

The stings of wasps or bees should be treated by pressing

the open end of a small key over the pricked part, and applying sal volatile, ipecacuanha powder, or a small plug of moistened tobacco.

Snake Bites.—Of the land snakes which are widely distributed over the surface of the earth, whilst most are venomous, others are quite harmless. Sea snakes, which abound in the Indian Ocean and along the coasts of South America, are almost all deadly. The bite of a poisonous land snake, as a rule, shows two marks, thus, · · when there are more than two marks ∴ it may be safely assumed that the reptile was not poisonous, or that the wound has not been inflicted by the poison fangs.* In sea snakes the two fangs are small, so that their marks are not very distinct.

In fatal cases of snake bite the duration of life varies according to circumstances. The patient may be killed in the course of a few minutes, or he may survive for many hours and even for days. The severity of the case will depend upon the kind of snake, its condition and vigour, and upon the amount of venom stored up in its poison glands. A bite on the face or body is, as a rule, more serious than one on the hand or foot, as the wound is nearer the heart, and the circulation of blood in the injured part cannot be stopped by the application of a ligature. Fright and mental excitement often make matters worse, and may by themselves cause alarming symptoms in cases of bite by a harmless snake.

Symptoms.—The wounded part becomes numbed, swollen, and of a dark colour as if bruised. The general symptoms in most instances are—faintness, short and difficult breathing, loss of power in the limbs, collapse, loss of consciousness, and convulsions. In bites from sea snakes the symptoms of poisoning often resemble those of lock-jaw.

As snake poison usually acts very quickly, the treatment should be prompt and energetic. If there be very little, if any, doubt that a bite has been inflicted by a deadly snake, such measures may be taken as could not be justifiably carried out by any unprofessional person in any other case of injury.

Treatment.—The modern treatment of these serious injuries is based to a great extent on the instructions laid down by Sir Joseph Fayrer, who has been led by his wide and practical knowledge of snake poisoning in India, to the conclusions that there is no real antidote for such cases, and that the rational treatment

* Sir William Moore, *The Immediate and General Treatment of Accidents and Injuries*.

is to prevent, as far as possible, the entry of the poison into the blood, to destroy its active properties before it is absorbed, and to support the strength of the patient.

If the bitten part be a finger or toe, or any portion of a limb well below the hip or the shoulder, a band of some kind (a handkerchief, a piece of stout cord, a shred of clothing, a brace) should *at once* be tied *very tightly* round the limb two or three inches above the wound, so that the skin below becomes cold and dusky. The amount of constriction may be increased by placing a small stick under the knot and twisting it round.

Two or more additional bands should afterwards be applied tightly above the first at intervals of a few inches, if there be enough room. The bitten part should then be cut across by the point of a sharp knife, so that it may bleed freely, and afterwards, without loss of time, be burnt out by a live coal, a red-hot iron, or, if it be at hand, by exploding a little gunpowder over the wound. If heat cannot be promptly obtained, an attempt should be made to cut out the seat of the bite, which will be much benumbed and almost painless, in consequence of the constriction of the tight bands or ligatures. The destruction or removal of the bitten part is an important point, and Sir Joseph Fayrer states that in the case of a finger or toe immediate amputation would be justifiable, if the sufferer or his companions having an instrument at hand, had the moral courage to lop off the part at once. After an interval of about half an hour (not less), when the part has been destroyed or removed, the ligatures should be gradually loosened, lest mortification of the extremity be produced by their pressure on the blood-vessels. If the bite be on the face or body, it should be well burnt or cut out. The wound should then be thoroughly washed out with Condyl's fluid, if this be at hand. Sucking a snake bite is by no means free from risk, though if the saliva be quickly ejected and the mouth washed, the danger is probably small.

The patient should be kept quiet, and if he become collapsed should be warmed by thick coverings, and mustard poultices or heated flannels over the stomach, and hot-water bottles to the feet. Brandy or whisky should be given frequently, and from 15 to 20 drops of spirits of hartshorn in half a wineglassful of water every quarter of an hour for about two hours. If the breathing become slow and difficult, artificial respiration (see Chapter xxix.) should be practised. As there is usually much mental depression in cases of snake bite, which, after all, may be due more to fright than to the action of the supposed poison,

every endeavour should be made to keep up the patient's spirits and to encourage him.

Pricks from Fish.—Serious wounds may be inflicted by the fins, tail, and gill covers of a fish, the injury being usually received either when carelessly handling a fish that has been just caught, or by stepping on one in shallow water. The wounds caused by many tropical fish, such as stingarees, cat fish, devil fish, and sea devils, are really poisoned, and are followed by much general disturbance, as well as pain and inflammation in the injured part.

The bite should be well washed with a strong solution of carbolic acid, or with Condyl's fluid, and afterwards covered by a bread poultice. The patient should be kept quiet for a time, and his strength kept up by ammonia and brandy.

Bites or scratches from any of the higher animals are also apt to give some trouble. The wound, even if not a poisoned one, often becomes painful and inflamed, and is slow in healing. The bite of a horse, though not usually deep, causes much bruising in most instances. In wounds caused by the dog or cat the skin is frequently torn and mangled. Much of the pain and inflammation which so often result from injuries of this kind is due to the irritating though not strictly poisonous nature of the saliva, or other fluids, introduced by the tooth of the animal.

Treatment.—The wound should be cleansed by a lotion of carbolic acid (half a dram to 2 ounces of water), then bathed with hot water, and afterwards dressed frequently with lint or linen dipped into a lotion composed of half a dram of Goulard's extract and half a pint of water, or with vaseline or some clean oil. The part if severely bitten should be kept at rest until the wound is free from pain and redness and has commenced to heal.

Hydrophobia.—The alarm excited by a bite from a dog is due in great measure to the apprehension of hydrophobia or dog-madness, a very serious and almost invariably fatal disease, which resembles in some respects a bad attack of lock-jaw or tetanus, and is marked by extreme irritability, severe and painful spasms, a profuse discharge of saliva from the mouth, and a dread of water and other fluids. In most instances it is caused by the bite of a rabid or mad dog, but may be caught from other animals, such as the cat, fox, and wolf, in a similar condition. In countries where wolves abound, hydrophobia usually of a very severe type is very frequent after the bite of this animal. The first symptoms of this disease very rarely

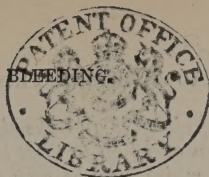
appear within the first month from the date of injury, and are often delayed for many weeks and even months.

Treatment.—At sea or far away from medical aid very little can be done to relieve or comfort a patient presenting grave and decided symptoms of this disease. As there is extreme sensitiveness to light, noise, especially the sound of flowing water, and to draughts of air, he should be kept if possible in a quiet and darkened berth. Attempts may be made to give strong fluid nourishment, and when the cramps are very severe an opium pill (5 grains) or 20 drops of laudanum with a little water, but in most instances it will be found very difficult to persuade the patient to take anything by the mouth.

Signs of Madness in a Dog.—The animal becomes dull, sullen, and snappish: “if a dog previously known to have no such habits, snaps indiscriminately at the first dog it meets, it is probably not safe” (*Burdon Sanderson*): a depraved appetite, the animal licking and eating material that is often foul and unsuitable for food; in later stages of the madness it often gnaws fiercely wood and other hard substances: it scratches its mouth and ears: a profuse dribbling of saliva; the limbs, especially the hind ones, become weak; the bark loses its clearness and becomes harsh and rough: “the eyes are red, dull, and half closed, the skin of the forehead wrinkled, the coat rough, the gait unsteady and staggering; the animal when approached is often quiet and friendly, and then snaps.” (*Youatt*).

Treatment of a Wound caused by a Mad Dog.—Although the bite of a mad dog is not invariably followed by hydrophobia, measures as thorough and energetic as those recommended in snake bite should be applied with the object of preventing the entrance of the poison into the blood. If the arm or leg be bitten an elastic tourniquet or tightened band should be applied above the wound until the part below is rendered numb and pale. The wound should then be burnt by a hot iron or by the explosion of a small quantity of gunpowder, or be thoroughly washed out with boiling water. The raw surface should finally be swabbed out with Condy’s fluid or strong carbolie acid.*

* In a case of bite from a rabid animal the injured person should, if within ready and speedy reach of Paris, take into consideration the possibility of submitting himself without delay to Pasteur’s preventive treatment by inoculation, which, according to good authority, has saved at least one thousand lives.



CHAPTER XV.

BLEEDING.

Important Physiological Facts :—DEGREES OF SEVERITY OF BLEEDING. Arterial Bleeding :—MODES OF TREATMENT—TORNQUETS—PLUGGING. Venous Bleeding :—CAPILLARY BLEEDING. First Aids IN BLEEDING FROM SCALP—FACE—NOSE—MOUTH—NECK—ARMPIT—ARM—FOREARM—PALM—THIGH—HAM—LEG—SOLE. Internal Bleeding :—FROM THE LUNGS—STOMACH—BOWELS—URINARY ORGANS.

As has been well expressed by a distinguished German surgeon, "it is a terrible position to stand beside some accident, to see the red blood pouring unceasingly from the wound, to see death every moment approaching nearer and nearer, and not know how to avert the evil."* The difficulties of such a position may, in many instances, be relieved by a recollection of the following simple and elementary facts :—

The blood purified in the lungs is pumped by the left side of the heart, with much force, into a continuous set of elastic branching tubes. These tubes, which are called arteries, carry the blood to all the organs and structures of the body.

The blood, after it has supplied the organs with nourishment, and taken up the products of "wear and tear," is returned to the right side of the heart by a separate set of tubes, called veins.

Interposed between the last and smallest branches of the arteries, and the first and smallest roots of the veins, is a very close network of very fine and minute blood-vessels, called capillaries. This network is so close that it is difficult to prick any living structure of the body, even the firm skin, without drawing blood.

The large arteries supplying the limbs are, in some parts of their course, covered by thick layers of flesh, and, in other parts, come close to the surface, where their beats or pulsations can be distinctly felt; as, just above the wrist, where the pulse is usually felt for, along the inner side of the arm, at the groin and upper part of the thigh, and on the instep.

There are two sets of veins: every artery is accompanied by one

* *First Aid to the Injured.* Von Esmaich. Translated by H.R.H. Princess Christian.

or two veins, the supply pipe and the discharge pipe or pipes, running side by side; in addition to these there are other veins running just below the skin, which may be seen in the leg after long exercise, and on the back of the hand and the front of the arm when the upper limb has been hanging down for some time.

The blood in the **arteries**, which is driven in strong and rapid streams from the heart towards the different organs, and along the limbs towards the fingers and toes, is of a bright red colour, like that of red sealing wax. The blood, as it returns by the **veins**, flows in a sluggish stream, and is of a deep purple colour.

When a large **artery** is wounded, the bright red blood is poured out quickly and forcibly in jerks or broken jets. When a large **vein** is opened, dark coloured blood is discharged in a continuous stream.

Healthy blood, when discharged from a wounded vessel, soon coagulates by setting into a jelly or clot. Such clot suffices, in a wound of a small vessel, to close the opening and stop the bleeding, but in a wound of a large vessel, more particularly an artery, is speedily detached and washed away.

The danger of a flesh wound, with regard to bleeding, depends not so much on its size as on its situation. A deep and gaping wound on the back of the arm or the outside of the thigh is not so likely to bleed freely as a much smaller wound, or even a mere puncture, over the course of a large vessel.

The most serious wounds are those in which a large artery has been opened or completely divided. A wound of the large artery in the groin, in the armpit, or in the neck, may cause death in a few seconds. If the vessel be opened further away from the heart, or if one of its branches be wounded, the bleeding, though not so rapid and profuse, will very probably prove just as serious. The flow of blood may go on continuously for hours, or it may recur again and again after a temporary arrest.

The signs that the wounded man has lost too much blood are: faintness, sighing, extreme restlessness, and a cold and moist skin; the face becomes pallid and like white wax, and even the red lips lose their colour.

Next in severity are wounds of large veins. Those of the large deep veins are as dangerous as wounds of the large arteries they accompany, but bleeding from a large superficial vein, as that visible through the skin of the thigh or leg, for instance, though speedily fatal if not attended to, may be readily stopped.

The least dangerous wounds are those in which only very small and terminal branches and capillary vessels are divided.

The bleeding from such sources, though it may in a large wound be free for a few seconds, will soon cease by itself, or may be readily stopped by the pressure of sponge or lint, or by bringing the edges of the wound together.

It would be well to bear in mind that there are some persons who bleed very freely and persistently when wounded, even though the wound be a very small one, or merely a scratch. Such persons are called "bleeders." Those suffering from scurvy and from the effects of bad "fever and ague" also bleed freely when cut.

When a large artery has been wounded the blood "wells up" freely and persistently, and is of a bright red colour. If the flesh wound be a wide and gaping one, and the injured artery be exposed, the blood may be spurted out in a jet on to the hands and face of the patient's attendant. *In such a case, if firm pressure can be applied to the injured artery between the wound and the heart the bleeding will stop.*

If black or purple blood flows in a steady and continuous stream from the wound, and if, in the case of a wounded limb, pressure applied firmly above the wound does not stop but increases the bleeding, it may be assumed that a large vein has been opened. *Then, in order to arrest the bleeding, pressure must be applied below and not above the seat of injury.*

In the so-called capillary bleeding, in which the blood comes from the smallest vessels, there is, after the first two or three minutes, merely a trickling, which in a healthy subject soon ceases.

Arterial Bleeding.—If called to a man reported to be bleeding to death from a wound, the first care of the captain should be to prevent him from being moved, and from moving himself. Any attempt on the part of the injured man to raise himself might increase the force of the pumping action of the heart, and, if the bleeding has ceased, the clot might be washed away by the accelerated flow and the bleeding thus renewed. As fainting and shock slacken the circulation, and may be regarded as nature's means of stopping bleeding, no brandy or other stimulant should be given before steps have been taken to effectually arrest the flow of blood. The patient's head having been slightly raised on a pillow or some other soft support, the clothing and other coverings of the wounded part should be rapidly but gently cut away, and the wound itself freely exposed. The state of the clothing and the colour of the shed blood will give some idea of the extent and nature of the bleeding.

The first step to take in any case of serious bleeding is to prevent, if possible, any further loss of blood, leaving for subsequent consideration the means of bringing the patient round, and of closing the wounds in the vessel and the parts over it. The best and most efficient way of stopping the flow of blood from a wounded *artery* in a limb is to apply firm pressure *above* the seat of injury. If the wound be below the groin or the armpit this pressure may be applied for a short time, and until better



Fig. 19. — Compressing Artery in Thigh.

and more effectual means can be obtained, by grasping the limb very closely by one or both hands (see Fig. 19). Afterwards a *tourniquet* should be applied. This is an instrument for stopping the circulation of blood in a limb. By far the best form for first aid purposes is that known as *Esmarch's elastic tourniquet*, which is included in the Official List of Medical Stores. It consists of a thick tubular band of indiarubber, which should be applied tightly round and round the limb, and be finally fixed by hooks attached to each end. If this be not at hand there need be no difficulty in finding an effective substitute. An elastic belt or a pair of elastic braces would be found very useful. Esmarch recommends that soldiers, sportsmen, &c., should wear elastic braces, so that they could use them to arrest bleeding from the legs or arms, either in themselves or others. Bleeding from a wound in any part of the upper limb may be readily stopped by placing a thick rod of wood across the armpit and by binding the arm to the side of the chest (see Fig. 20). Another useful contrivance

for the arm is *Völcker's stick tourniquet*, made up of two thin sticks of wood, each about 8 inches in length. One of these is placed on the *inside*, the other on the *outside* of the limb, and the two are bound together back and front by handkerchiefs or strips of torn clothing (see Fig. 21).

The most ready way of stopping bleeding from a wound below the armpit or the groin, is to tie a folded handkerchief rather loosely about the limb *above* the wound, and to tighten this by thrusting in a stick between the skin and the knot, and twisting it round and round (see Fig 22).

In the excitement of the moment there may be a risk of the tourniquet being applied with unnecessary violence, and of the skin being bruised or torn. Except in very stout or very mus-



Fig. 20. — Stick Tourniquet in Armpit.

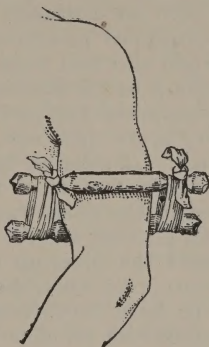


Fig. 21. — Völcker's Tourniquet.

cular persons the main artery of a limb may be closed with but slight squeezing of the skin and flesh. A trial on oneself or on another with the elastic band or the stick tourniquet on the arm, will prove that the pulse may be stopped at the wrist without causing much pain or discomfort at the seat of pressure.

If the bleeding come from a part where a tourniquet could not be used, as in the neck, armpit, or groin, an attempt should be made to stop the flow of blood by thrusting the fingers to the bottom of the wound and pressing on the injured vessel. In an emergency, direct pressure on the bleeding spot is better than trying to close the artery by finger pressure on its way to the wound. The situation of the vessel might not be known, and, even if it were, much difficulty might occur in applying pressure in the right direction.

The bleeding having been stopped for a time by one of the means just described, the wounded man should at once be placed under professional treatment, if such be available. If, however,

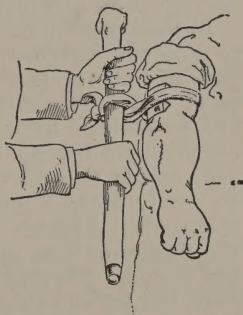


Fig. 22.
Stick Tourniquet.

he be far away from doctor or hospital, an effort must be made, after he has been brought round and undressed, and after the seat of injury has been cleansed, to arrest the bleeding at its source. Unless there be a prospect of obtaining surgical aid in the course of forty-eight hours, the use of the tourniquet must soon be dispensed with, as it must be obvious that the long continued pressure will not only cause intolerable pain, but might also lead to gangrene of the limb.

If there be no return of the bleeding after the removal of the tourniquet, the patient must be kept perfectly quiet and on very spare diet, and no attempt should be made to move the limb. If, after an interval of twenty-four hours, the wound still remain free from fresh blood, it should be closed and dressed in the usual way (see *Wounds*, p. 117), the man being kept on his back until it has healed.

Should the bleeding return very soon after the removal of the tourniquet, this should at once be applied again a little *above* or *below* its former situation. The wound should then be cleaned and all clots removed by syringing with cold water. If the wound be a large and gaping one, the bleeding vessel might be seen on again relaxing the pressure of the tourniquet, and a jet of bright red blood might be spurted over the hand and face of the attendant. In such case the exposed and divided vessel might be taken up by forceps and tied with fine thread, or the thread might be carried under the artery by a straight sewing needle and then tied.

In most cases of persistent bleeding it will be found necessary to *plug* the wound—that is, to fill it up from the bottom with pads of lint varying in size, the smallest being of the size of a small cork. This should be placed over the wounded vessel, and be covered by larger and larger pads, until the wound is completely filled up to the level of the skin. The mass of pads should then be covered by a folded towel, and a bandage be firmly applied round and round the wounded portion of the limb. Another bandage should then be applied from the fingers or toes upwards as far as, and then again above, the wound. *The limb should then be elevated above the level of the body*, the leg and thigh being raised almost to a right angle on a board, and the arm being supported by the side of the head on a high bank of pillows or folded clothes. The tourniquet should be removed after an interval of an hour, the pressure being very gradually relaxed.

If the bleeding be stopped the limb should be kept raised and undisturbed for at least two days. Afterwards the surface of

the wounded region may be uncovered and cleansed by cold water. The pads contained within the wound should be allowed to come away by themselves.

Should the bleeding unfortunately recur after this treatment, the captain must persevere in the application of pressure. It would be well to use direct and indirect pressure alternately—that is to say, to apply a tourniquet lightly for an hour, and then for the next two or three hours to have pressure applied by attendants directly over the mass of pads stuffed into or placed over the wound. If the bleeding wound be below the knee or the elbow the limb might be bent so that the heel almost touches the buttock, and the fingers are brought in contact with the front of the shoulder. If this position prove very painful, or if it have no effect on the bleeding, the wounded limb should be again raised. By constant attention to these details the bleeding may be kept under control for some few days, and until an opportunity is afforded of obtaining professional help.

Venous Bleeding.—If a large superficial vein be wounded the bleeding may be readily arrested by the pressure of the finger or of a pad of lint or linen on the wound, or over the vessel itself—*below* the wound if it be in the upper or lower limb, above if it has opened the large jugular vein in the neck, which may in a thin person be seen running from the angle of the jaw to the middle of the collar bone. The most common and serious instance of venous bleeding is that of wound or ulceration of a swollen or varicose vein in the leg. A stream of black blood is rapidly poured out, and in the course of two or three minutes the patient becomes faint and pallid. In such a case what little has to be done must be done promptly: the bleeding person must be made *to lie down*; any *tight article of clothing* above the seat of bleeding, as, for instance, a garter or closely fitting drawers, must be removed; the leg must be *raised above the level of the trunk*; and *pressure* must be made on the bleeding wound or ulcer, at first with the *thumb or finger*, and afterwards with a *small soft pad* secured by a handkerchief tied round the limb. If the pad be allowed to remain the opening in the vein will close in the course of two or three days, and, if the patient be careful and wear a bandage or an elastic stocking, will give probably no further trouble.

Capillary Bleeding.—This is the oozing of blood which occurs in all open wounds. This usually stops of itself in the course of a few minutes in a healthy person, but in those enfeebled by illness or by the effects of a hot climate the small vessels may not contract or the shed blood may not form clots. In most

cases of bleeding wound, however, in which no large artery or vein has been opened, the flow of blood may be stopped by (a) the pressure of a *clean* sponge on the bleeding surface; (b) by stitching the edges of the wound together and applying a pad, and, over this, a firm bandage; (c) by applying to the bleeding parts either very cold water, or a mixture of equal parts of water, heated almost to boiling point, and spirits of wine.

FIRST AID IN BLEEDING FROM DIFFERENT PARTS OF THE BODY.

Scalp.—The bleeding from a “cut head” is usually free and often very persistent. As the wounded artery can be readily pressed against the hard skull, the flow of blood may be stopped at once by placing the finger over the wound, and compressing the leaking vessel. The wound should afterwards be covered by a small pad fixed securely by a bandage or handkerchief (see Chapter xxxi.).

Face.—The flow of blood, which, for a time, is very free, from a large wound in this region may be stopped by pressing the wounded part against the bone, or by squeezing the thickness of the cheek or lip between the finger and thumb, the pressure being applied on the inside of the mouth and on the surface of the skin. The artery which supplies the face with blood may be closed by pressure over the lower jaw, about two inches in front of the angle (see Frontispiece). It would be found necessary in a case of alarming bleeding from a wound in the face, to compress this artery on both sides. The most effectual way of stopping bleeding from the face would be to bring the edges of the wound together by fine stitches, carried not merely through the skin, but taking up almost the whole thickness of the divided cheek or lip.

Nose.—Apply ice or cold water to bridge of nose and back of neck. The man must not let his head hang down, but should sit or stand up, and from time to time raise his hands high above the head (see Chapter xix.).

Mouth.—The bleeding from the gums in scurvy may be controlled by sucking ice or small pieces of alum. In a wound or bite of the tongue blood flows very freely for a short time, but will soon disappear if the patient can open his mouth widely and thus take in cool and fresh air.

Neck.—Profuse and continuous bleeding from a wound behind the jaw or in front of the neck is very serious. All that can be done, in the absence of a medical man, is to apply firm

pressure over or within the wound by finger or a pad, and to press down the thumb or fingers *very firmly* over the large artery (carotid) which passes up the neck, between the windpipe and the thick and prominent muscle on either side.

Armpit.—Here, as in the neck, bleeding from a deep wound is very serious. The thumb should be pushed into the armpit and pressed against the upper end of the arm bone. A handful or more of tow or oakum should then be thrust into the armpit, and the arm be bandaged to the side over a thick stick placed between the pad and the side of the chest (see Fig. 20), or, if an Esmarch's tourniquet be at hand, this may be applied

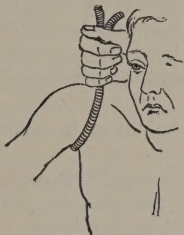


Fig. 23.

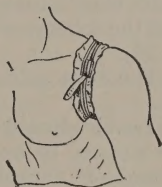


Fig. 24.

Tourniquet in Armpit.

round the armpit and carried over the top of the shoulder (Figs. 23, 24).

Arm.—The main artery can be readily compressed by the fingers, in the depression along the inner surface of the arm, which corresponds to the inside seam of a coat sleeve. Afterwards an Esmarch's tourniquet, or a stick tourniquet (Fig. 22), may be used, or a short and thick piece of wood may be placed high up between the arm and the side of the chest, and the arm be bandaged to the body (Fig. 20). The wound should then be dressed, and the forearm supported in a sling until the patient is seen by the doctor.

Forearm.—The bleeding should be stopped at first by pressing on the main artery above the elbow, as in bleeding from the arm. A pad of folded canvas, or, if the case be a very pressing one, the rolled-up coat sleeve may be placed in front of the elbow, and the forearm be bent and fixed securely by a bandage in such a position that the finger-tips touch the shoulder. If the wound be near the wrist, a pad of linen or a folded handkerchief should be applied to the wound, and kept in place by a triangular bandage (Chapter xxxi.) or a strap.

Palm of the Hand.—Firm pressure on the wound with the thumb or finger will usually stop the bleeding. If this fail and the bleeding be very free, the forearm should be bent at the elbow, or an elastic tourniquet be applied just above the elbow. For further treatment of wound in the palm (see Chapter xxii.).

Thigh.—Arterial bleeding from a deep wound on the inner side of the thigh is usually very free, and demands prompt aid. An attempt should be made to compress the main vessel by thrusting the two thumbs deeply down in the middle of the thigh near the groin, the fleshy parts on either side being firmly grasped by the fingers (Fig. 19). If this fail a pad made of a small roll of canvas or of similar firm material should be placed over the front and inner part of the thigh, and be tightly secured by Esmarch's elastic tourniquet, or if this be not available at the moment by the extemporised "stick and handkerchief" tourniquet (Fig. 22).

Ham.—The same action should be taken as in wounds of the thigh.

Leg.—Free bleeding from a wound in the front or back of the leg may be stopped by applying either the elastic or the "stick and handkerchief" tourniquet (Fig. 22) to the lower part of the thigh, or by bandaging a firm pad in the hollow of the ham, and then bending the knee so that the heel almost touches the buttock. Bleeding just in front of the ankle, or behind the inner projection of the ankle, may be stopped by the direct pressure of the finger or a pad.

Sole of the Foot.—A small pad should be applied over the hollow just behind the inner ankle, and another over the front of the ankle, and these should be kept in place by a handkerchief tied tightly around the limb. The knee should be bent as in a case of bleeding from the leg, or, if this position causes much discomfort, the lower limb should be raised high above the level of the body. *"In all cases of arterial bleeding from the lower limb place the injured man at once in the lying down position, and, if possible, have the limb elevated while compression is being applied above the wound."**

INTERNAL BLEEDING.

From the Lungs (*Haemoptysis*).—Spitting and coughing of blood may occur after injury to the chest, and in cases of consumption and heart disease.

Though often profuse and persistent, and, naturally, alarming, it seldom causes death in cases of consumption.

* *Ambulance Work*, R. Lawton Roberts, M.D., p. 74.

It may be assumed that the blood comes from the lungs (*a*) when it is coughed up, (*b*) when it comes into the mouth in small quantities and at intervals, (*c*) when the blood is of a bright red colour and more or less frothy, (*d*) when the quantity of blood varies in the course of the day, (*e*) if, should the bowels be opened in the course of the attack, the stools present their natural colour.

From the Stomach (*Hæmatemesis*).—Vomiting of blood usually results from disease (ulcer, cancer) of the stomach, and from congestion of the liver. It may occur after a severe injury to the head, and in bleeding from the nose.

Though not often repeated more than once or twice on the same day, it is much more serious than bleeding from the lung, causing much prostration, and, in many instances, death.

(*a*) The blood is vomited and not coughed up; (*b*) it comes away usually in large quantities, from $\frac{1}{2}$ pint to 2 pints or more; (*c*) it is in most instances discoloured, being reddish-brown, or it may be quite black; (*d*) it is often mixed with food; (*e*) the patient is usually faint; (*f*) the stools may be mixed with dark-coloured blood.

Treatment.—In bleeding from the lungs the patient should be kept as quiet as possible in an airy berth, and not be allowed to sit up in a chair nor in bed. He should suck ice, if this can be obtained, or sip cold water or lime-juice drink, but must not take any wine or spirits. In ordinary cases no special nor active treatment is required, all that is necessary to do is to prevent alarm and excitement, and to keep the patient very cool.

When blood is brought up in large quantity from the stomach the patient should be kept at rest on his back, and take by the mouth *nothing more* than pieces of ice or sips of cold water. If ice can be obtained some large pieces should be applied in a sheep's bladder or a proper ice bag over the stomach. If there be no ice a towel or napkin wrung in cold sea water should be applied every ten minutes. Should the attack pass off and the patient recover great care should be taken with regard to the diet. If more than milk or fluid nourishment in small quantities be given in the course of the first week the bleeding will probably return.

Bleeding from the Bowels may occur in the course of some severe disease (typhoid fever, yellow fever, scurvy). When coming on in a man apparently in good health it is usually due to internal piles. In such cases the blood is of a bright-red colour and comes away after stool. Though only a small quantity of blood may be discharged at a time, the frequent repetition

of the bleeding often causes much weakness and a decided loss of colour, the face becoming pale and bloodless and the lips livid.

If the bleeding from the bowel be profuse the patient should be kept in his bunk for two or three days, and be purged by blue pill (5 grains) at night, and a dose of Epsom salts (2 drams) on the following morning.

Bleeding from the Urinary Organs may result from injury to the kidney, bladder, or urethra; to stone in the kidney; to tumour of the bladder; to that very rare disease amongst seamen, stone in the bladder; to disease of the prostate.

If, after a serious fall or a violent blow on the loins, the urine is deeply stained, resembling in colour porter or claret, the blood has very probably come from a bruised or torn kidney.

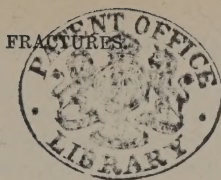
If, without any injury, the urine becomes deeply stained and the patient, just before the appearance of the blood, has complained of severe pain in one loin extending down to the groin, the bleeding may have been caused by a stone in the kidney.

If the urine be mixed from time to time with large quantities of bright red blood, being pale at the beginning of the stream as the man makes water, and very thick, dark, and clotted towards the end, the presence of blood, if there has been no recent injury to account for it, may be due either to a tumour or to stone in the bladder.

A discharge in small quantity of almost pure red blood after an injury, either to the lower part of the belly or to a fall on the perineum or fork, will usually be the result, in the first case, of ruptured bladder; in the second, of torn urethra.

Bleeding from the urethra may occur in the course of a severe attack of gonorrhœa (clap) or have been caused by passing a catheter.

Bleeding from the kidney, whether due to injury or to stone, will cease in the course of two or three days if the patient be kept in his bunk, and take plenty of barley water or plain water. Bleeding from the bladder should also be treated by rest and the application of ice or cold water to the lower part of the belly. The most serious forms of bleeding are those from the bladder or urethra after injury, and in such cases an attempt should be made to pass a soft catheter which, if it has reached the bladder, should be tied in. See *Rupture of the Bladder* (Chapter xxiv.), and *Torn Urethra* (Chapter xxvi.).



CHAPTER XVI.

FRACTURES AND DISLOCATIONS.

Fractures :—KINDS—TREATMENT. Dislocations :—SIGNS—TREATMENT.
Sprains.

FRACTURES.

BONES, though very hard, are frequently broken by external force, as in blows and falls, and sometimes by violent muscular exertion. Injuries of this kind are called **Fractures**.

The bones most frequently broken in the adult through injury are those of the leg, the thigh bone (femur) and the arm bone (humerus).

When there is no bleeding and no wound of the skin, the fracture is called a *simple* one. When the skin and flesh at the seat of the injury are wounded the fracture becomes a *compound* one (Fig. 25).

This distinction is an important one. When there is no wound the broken bone unites without inflammation or danger to the general health. In compound fracture air or dirt may get into the wound and set up serious and, it may be, fatal mischief. When the bone at the seat of injury is not only divided, but broken down in two or more small loose pieces, the fracture is called a *comminuted* one (Fig. 25).

A *simple* fracture may be readily converted into a *compound* one by careless and rough handling. For this reason great care should be taken in protecting and securing a broken limb before the patient is removed from the scene of the injury.

In *multiple* fracture the bone is broken across at two or more places. If one of the two fragments of a broken bone be driven into and fixed in the other fragment, the fracture is an *impacted* one.

In fracture of a bone—that of the thigh, for instance—there is *shortening* of the limb, with more or less *deformity*, caused by displacement of the bone and by swelling of the soft parts, there is much *pain* about the seat of injury, and any movement of the limb, however slight, may cause the man to cry out. There is at the seat of the fracture an *unnatural mobility* or *looseness* of

the bone, one part moving more or less freely on the other. On touching the injured part and at the same time gently moving the limb, a *grating* (*crepitus*) may be felt.

In examining a man with injury, and suspected fracture of a limb, the limb on the opposite side should be exposed, so that the two limbs may be compared.

The ends of the two fragments of the broken bone are joined together at first by a mass of yielding gristle-like material, which

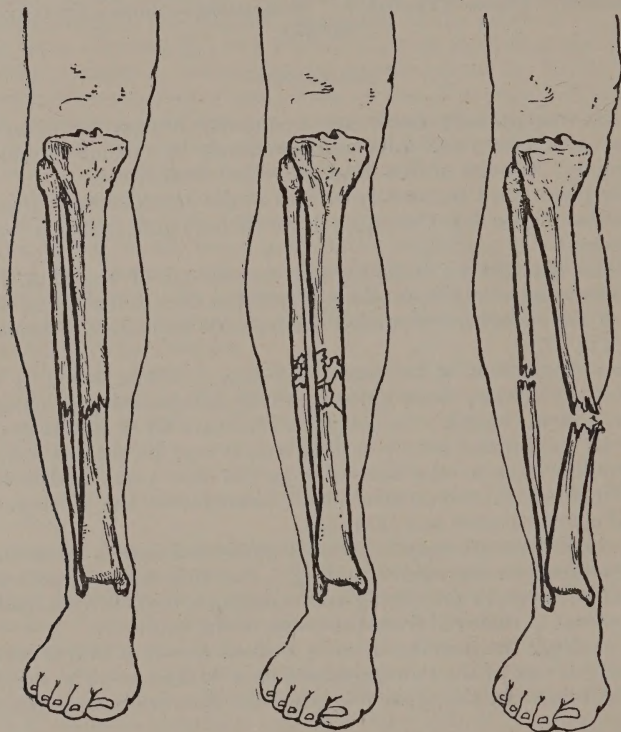


Fig. 25.—Forms of Fracture.

hardens into firm bone. In a healthy man a broken thigh bone usually unites firmly by the end of the second month, the bones of the leg in six weeks, and the arm bone in one month. If the patient be weak or in bad health, or if the broken bone be not

well set in splints, the union of the fragments may be retarded for several weeks or even months.

If the patient be seen before removal from the place of injury, the clothes must be carefully cut away from the injured limb, and, in the case of a broken leg, the boot must be removed very slowly and gently. In order to avoid suffering, and to prevent the ends of the broken bone penetrating the skin, the injured limb must be well protected during the removal of the patient to a hospital or his bed. This protection is to be afforded by applying some soft and thick material (canvas, the patient's clothing, tow, wadding, straw, &c.) next to the skin, and over this one or more extemporised splints (boards, sticks, iron rods, &c.). Different forms of first-aid appliances are described in the sections on Fractures of the Upper and Lower Limbs, and are illustrated in Chapters xxii.-xxiv.

In the removal of the patient, if the upper limb be injured it should be supported in a sling (Chapter xxxi.), and if the thigh or leg be broken, the two limbs should be bound together.

If, from the situation or severity of a fracture, it be necessary to keep the patient on his back for some time, he should lie on a firm mattress. If he be treated on a fixed bedstead, and not in a bunk, deal boards, each about a foot in width, should be laid under the whole length of the mattress or bed.

In the treatment of a broken limb, the fracture must be first set by pulling down the displaced lower part of the broken bone, and by gently pressing it into its natural position. The ends of the broken bone are then to be kept together by splints or some other appliance.

In broken thigh, and also in some cases of broken leg and arm near the knee and shoulder, the fragments of bone may be kept together, and in good position, by stretching the lower portion of the limb by a weight suspended on a pulley; the weight acting in one direction, and the resistance of the patient's body acting in the other. This method, which is simple, and in most cases very efficient, is described at Chapter xxiv

DISLOCATIONS.

In dislocation one bone is separated from another, and put "out of joint." In the hip the rounded head of the thigh bone is displaced from its socket, and in the shoulder the upper end of the arm bone is no longer in contact with the shallow socket on the shoulder blade. The ligaments and muscles of the injured

joint are torn or stretched, and the skin is sometimes much bruised.

Signs of Dislocation.—The *form* of the joint is much altered; for instance, in dislocation of the shoulder, the outer surface of the joint is flattened; and in the common form of dislocation of the upper end of the thigh bone, there is an unnatural projection of bone at the hip.

There is *loss of power*, the patient being unable to work the joint. The dislocated joint is very stiff, and cannot be moved in any direction or to any extent without giving the patient much pain.

A dislocation may be complicated by (a) a wound of the skin and flesh; (b) laceration of a large blood-vessel; (c) fracture of the displaced bone.

In most cases a dislocation, when recent, may be put right or *reduced* by proper surgical treatment. If left to itself for some weeks the bone can no longer be replaced, and the injured limb may become much deformed and crippled.

If there be any prospect of obtaining professional aid within the first week, it would be well *not* to make any attempt to replace the bone. In muscular men it is often impossible to do this without giving chloroform or ether, and violent stretching and twisting may do serious harm. As, however, an unreduced dislocation of a large joint in either of the limbs must cause very serious inconvenience, and probably disable the patient for life, suggestions have been given elsewhere (Chapters xxii.-xxiv.) as to the most suitable methods of dealing with such injury when the possibility of obtaining medical help is very remote.

In "*first aid*" treatment, the injured limb, if it be arm or forearm, should be fixed in a sling, and, in the case of a dislocated hip or knee, be supported by pillows.

SPRAINS.

In an injury to a joint from wrenching or twisting, though the bones may remain in place and not be broken, the sinews and ligaments may be torn, and much bruising produced. An injury of this kind is called a sprain. It causes much pain and swelling, and the injured joint remains tender and stiff for some weeks. In old, and gouty or broken-down men, a sprained ankle is, in its results, as bad as, if not worse than, a broken leg, the patient remaining lame for months after the injury, and becoming, perhaps, more or less disabled for life.

A sprain, if quite recent, may be treated with benefit by rest of the swollen and tender joint, and the frequent application of flannel dipped in hot water. In the case of a sprained ankle, when the pain and swelling have subsided, a plaster of Paris or starch bandage should be applied around the joint, over a flannel bandage or a thick sock. If the wrist be sprained, the hand and forearm should be bandaged on to a well-padded straight splint, and be often "douched" with sea water.

CHAPTER XVII.

THE "FIRST AID" TREATMENT OF INJURIES, GENERAL INSTRUCTIONS, METHODS OF TRANSPORT.

Precautions :—METHODS OF TRANSPORT—HOW TO CARRY A PATIENT—
WITH ONE OR TWO BEARERS—BY STRETCHERS.

THE following precautions should be observed by anyone called upon to give immediate and temporary help in a case of recent and severe injury :—

- (1) Brief enquiry should be made as to the cause of the injury.
- (2) The patient, if standing or sitting, should be laid on his back, the head being raised above the level of the body by some soft support—a folded coat or a roll of canvas.
- (3) If any portion of the clothing be saturated with blood, the source of the bleeding should at once be sought for, and an attempt made to stop the flow, either by direct pressure of the fingers on the wound, or by applying, if possible, a handkerchief or tourniquet tightly above the seat of injury.
- (4) For the sake of good light and fresh air all bystanders, with the exception of one or (at the most) two assistants, should be requested to move aside.
- (5) If the patient be faint, his face should be sprinkled with cold water. Except in cases of extreme collapse and pallor, and those in which there has been much loss of blood, no brandy or other alcoholic stimulant should be given. If drink be asked for, cold water, or cold tea or coffee if at hand, may be given.
- (6) If there be no bleeding wound, a sharp cry from the patient when a particular part of the body is touched, or swelling, or shortening, or an unnatural position of a limb might lead to discovery of the seat of injury. Insensibility and noisy breathing,

with bleeding from one or both ears, would point to a severe injury to the brain; spitting up of bright red and frothy blood to a wound of the lung; and intense pain in the belly, with vomiting of dark blood, to damage of the stomach or bowels. Intense and rapidly increasing prostration, with pallor and restlessness, would very probably be due to internal bleeding.

(7) In exposing an injured part as little clothing as possible should be removed. In an injury to the leg or arm, the leg of the trousers or the coat sleeve should be ripped up along one of the seams. The boot and sock should be cut away from a damaged foot or ankle, not pulled off. If it be found necessary to examine the chest or belly the waistcoat and trousers need not be taken off, but be simply unbuttoned. The braces should also be loosened. In every case of serious accident and other emergency, all tight articles of clothing, especially any about the neck, should be removed.

(8) Before the patient is removed, any wound on the surface of the body should be gently cleansed with warm water, to which a small quantity of carbolic acid (about 2 teaspoonfuls to half a pint) has been added, and be covered by a layer of clean linen moistened with this fluid. If the leg or thigh has been injured, it should be supported during the carriage of the patient by an improvised splint (a short or broken oar, one or more narrow boards, or a thick fold of canvas stiffened by wire rope).

(9) The patient, if cold and collapsed, should not be moved whilst in this condition, but be kept warm, and, if on deck, be covered by thick canvas or tarpaulin.

(10) In every case of serious injury, the patient should be placed under professional treatment at the earliest possible opportunity, and, if the vessel be in port at the time of the accident, a written message, stating the nature of the injury, should at once be sent to the nearest doctor.

If a man has met with a serious injury at sea, and surgical aid cannot be obtained, steps should be taken to relieve his pain, to render him as comfortable as possible, and to ward off mischief by attention to cleanliness, good ventilation, and suitable food. He should not be carried to a forecastle, but be placed in an airy and almost empty berth—in a deckhouse if possible, or, better still, weather and climate permitting, under an improvised tent on deck.

If the clothes be dirty or blood-stained it would be well to remove them before the patient is put to bed. He should be undressed gently and with much care, and if he be in pain, and the injury be an extensive one, as a bad burn or scald, no attempt

should be made to save any of the clothing that cannot be readily slipped off.

In removing clothes in a case of broken bone the uninjured limb and the same side of the body should be undressed first. In putting on the bed clothing, on the other hand, the injured parts should first be covered. If the injured part be the arm or shoulder, the corresponding sleeve of the shirt should be slit up along the outside, so that the seat of injury can be exposed or dressed without moving the limb.

Methods of Transport.—Much has been done of late years to improve and perfect the means of carrying a helpless patient to home or hospital with the least possible discomfort and risk. The greater care taken of the wounded in recent campaigns, and the increased duties of army surgeons, have led to a close study of this subject by Medical Staff Corps, and to the issue from these medical bodies of very valuable instruction. This instruction, however, which is fully embodied in the rules laid down by the Army Hospital Corps and the Volunteer Medical Staff Corps, is too complicated to be carried out, except by an organised and well drilled body of men. Thanks to the St. John Ambulance Association and to Mr. John Furley, whose eminent services in carrying out the objects of this institution have acquired for him a world-wide reputation, the difficulty of applying the results of so much good work to the first-aid treatment of accidents and emergencies in civil life has to a considerable extent been overcome. For the instruction of those attending first-aid classes this association has issued rules for carrying patients and a series of stretcher exercises,* which though brief and simple will be found capable of meeting every ordinary requirement. As such instruction cannot be effectually imparted except by actual demonstration, it is very desirable that both officers and men of the mercantile marine should, when at home, attend a course of lectures given by a recognised teacher of the St. John Ambulance Association.

How to Carry a Patient.—In cases of slight injury, and when the injured man is quite sensible and can sit or stand, though unable to walk alone, he may be removed with the help of one or two persons. An insensible patient may also be carried by hand when found in a place where a stretcher cannot be used. In every case of disabling injury the patient, *if he has to be carried far*, should, if possible, travel on a stretcher.

With One Bearer.—The patient, if sensible, should put one arm—that on the uninjured side of the body—round the neck

* *First Aid to the Injured*. Surgeon-Major Shepherd and Robert Bruce.

and over the opposite shoulder of the bearer, who, on his part, throws his arm round the waist of the patient and at the same time with his other hand grasps the patient's hand that hangs over his shoulder (Fig. 26). If the bearer finds that the patient,



Fig. 26.—One Bearer.

though sensible, is too weak to be moved in this way, he may carry him either on his back or, as he would bear a child, in his arms, the patient assisting by throwing both arms around the bearer's neck.

There are several ways in which an *insensible man* may be carried for a short distance by a *single bearer*. The patient may be lifted by either of the two methods called by children "pig-a-back" and "weigh-butter." A good method, which allows some

freedom to the bearer's hand, is the following, described by Captain Eyre M. Shaw* :—First turn the person face downwards (standing in a line with the patient and facing his head) and take hold close up under each armpit; then raise the body as high as it can be lifted in that position, and allow it to rest on one of the knees; then shift the arms round the waist, and, after interlocking the hands, lift the insensible person into an upright

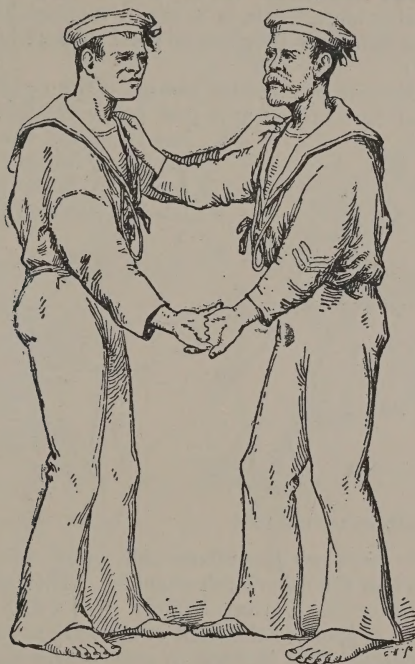


Fig. 27.—Two Bearers.

position. After this, take hold of one of his wrists with one hand, and drop into a stooping position; at the same time pass the arm that is free between or around the legs, and the person will then fall across the shoulders; then rise in an upright position and balance the body on both shoulders.†

* *Fire Protection*, by Captain Eyre M. Shaw.

† A method giving still more freedom to the hands was communicated to the *Lancet*, March 28, 1885, and is described also by Dr. Lawton Roberts in his excellent *Lectures on Ambulance Work*.

With *two bearers* the task of carrying a patient is much less arduous. Of the many ways in which a helpless man may thus be moved a short distance, the following are perhaps the simplest and best:—

The Two-handed Seat.—The bearers stand side by side, the one on the right clasps with his right hand the left hand of the other bearer; the two free hands are then placed by the bearers on each other's shoulder. This is a useful method for carrying a patient who is faint and helpless, as good support is given to his back (Fig. 27).

The Three-handed Seat.—The bearer on the right grasps with his right hand his own left arm just below the elbow, and with his left hand the left arm of his fellow-bearer; at the same time the latter bearer places his left hand on the right arm



Fig. 28.—Three-handed Seat.



Fig. 29.—Four-handed Seat.

of the latter—between the elbow and wrist—whilst his right hand is placed on the other's left shoulder. This, which is a less trying method for the bearers, affords, with a firm and comfortable seat, good support to the back of the patient (Fig. 28).

The Four-handed Seat is made by each bearer clasping his left wrist with his right hand, and then the right arm—midway between the elbow and the wrist—of the other with his own left hand. The two bearers then stoop down behind the patient, who sits on the clasped hands and throws his own arms round the necks of the bearers. This, unless the patient is strong enough to support himself by his arms, is a very uncomfortable one for the bearers (Fig. 29).

If the patient is insensible, one of the bearers standing behind the head must carry the upper part of the body, his arms being carried under the armpits and across the breast of the patient,

whilst the other bearer who walks in front carries the legs, one in each arm (Fig. 30).

A helpless patient should never be carried or dragged along by the arms and legs, with the face downwards.

Carriage by Stretcher.—A temporary stretcher may be readily made if a proper one cannot be obtained. A door or



Fig. 30.—Two Bearers.

shutter; an overcoat turned inside out, slung on two poles thrust through the sleeves, and then buttoned; or a large sack slung on two poles, each thrust through a hole made in each corner of its closed end or bottom, will answer the required purpose. On board ship there should be no difficulty in improvising a strong

and comfortable stretcher. A cot is often used, but this is often too large and heavy. A hammock is comfortable for the patient,



Fig. 31.—Macdonald's Stretcher.

1. Hook or eye bolt fixed to the beam over the hatchway. 2. A "double whip" or a purchase with a double block above and a single one below, *a* and *b*; *c*, the hauling part. 3. A "span" with an eye in the middle for the lower hook of the purchase. 4. A pole $4\frac{1}{2}$ feet long, with which the span is connected. 5. An ordinary hammock attached by the head and foot clews to the extremities of the pole and further sustained by lanyards, *a*, fixed to a ham-piece, *b*, besides which a strengthening foot-piece, *c*, is retained in its place by the foot clews of the hammock, and greater security is given to the patient by the strap and toggle, *d*, holding the sides of the hammock together.

but difficult to carry. The best and most ready method is to take a long and broad piece of canvas or tarpaulin and two poles,

which may consist of short oars, boat hooks, or light spars of any kind. A hole should be made near each of the four corners of the piece of canvas. Then the canvas should be doubled and one pole passed through the four holes, and the other pole along the folded side. If there be time, two short sticks should be placed across the two poles, one near each end of the stretcher, and be secured by cords, so as to prevent the poles from coming together.

For the transport of sick and wounded, when stretcher carriage is not available or cannot be used, Dr. T. D. Macdonald, F.R.S., R.N., designed an "ambulance lift for ship or shore." The ham-piece (b) would give great support in cases of injury of the lower limbs* (Fig. 31).

Mr. H. E. Armstrong, of Newcastle, has had a special cot made for the removal of the sick from a ship and from place to place. This consists of a chain and spiral spring mattress (*Chorlton*), 4 feet 2 inches by 1 foot 3½ inches, in a light iron frame attached to a curved ash frame made a little shorter in length, so as to allow the mattress to "dish" or curve downwards a little, for the patient to rest on. The iron frame is loosely attached at the sides to stout ash poles with hinged handles, so as to allow of turning in small space. The poles are separated by cross-pieces, to which the ends of the mattress are firmly fixed. To the upper of these cross-pieces a head-board is hinged, which may be set at any angle required. The cross-piece of the lower end is provided with a foot-board. Over the mattress and head-board are placed an india-rubber air-bed and pillow, each in a calico case. When the patient is in the cot the bed clothing is placed over him, and all is made secure by means of straps and buckles.

The method of lowering a patient in a cot is as follows:—The rope which is fixed by the eyelets and clove hitches, as shown in the illustration (Fig. 32), is made to cross over the middle of the patient's body in equal lengths, and under the crossing the hook of the lowering tackle is put in "fore and aft," and firmly lashed in its place. The tackle is fixed to the end of the yard-arm or the head of a davit, and the patient lowered with safety to a boat or launch† (Fig. 32).

In placing a patient on a stretcher he should be lifted by two

* *The Surgeon's Pocket Book*, Porter and Godwin, p. 19. A description, together with an illustration, of another very useful ambulance lift, devised by Medical Inspector A. C. Gorgas, U.S., is given by Mr. Spooner in his revised edition of *Harry Leach's Ship Captain's Medical Guide*.

† *Marine Hygiene: a Treatise on Hygiene and Public Health*, Stevenson and Murphy, vol. ii., p. 195.

helpers, one kneeling at each side. As these raise the patient with their opposite hands clasped under his back and hips, the stretcher, already placed with its bottom end near his head, should be moved under the body by a third helper. If the case be one of injury of the head, of a broken arm or leg, and there be only three helpers, the two who lift the patient should move him on to the stretcher, whilst the third helper takes charge of and supports the injured part.

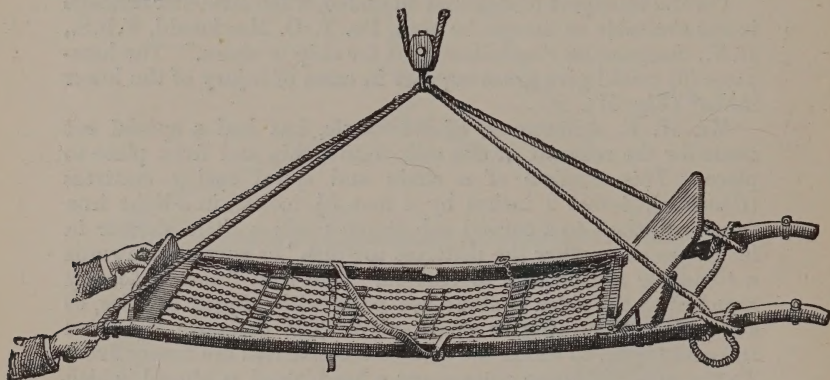


Fig. 32. —Armstrong's Stretcher.

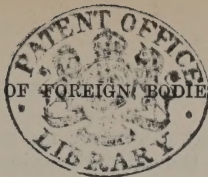
In conveying a patient on a stretcher the following precautions should be attended to:—

(1) The stretcher should not be supported on the shoulder, but be carried with the hands or be supported by rope or straps round the bearers' shoulders.

(2) The patient's feet must be in front, on level ground, and, except in cases of broken thigh or leg, in going down an incline. In such cases, and also in going up hill, the head should be foremost.

(3) The bearers should take short paces, and not keep step. The left foot of the bearer behind should move with the right foot of the bearer in front.

(4) The stretcher should be kept level, and not be swayed from side to side.



CHAPTER XVIII.

REMOVAL OF FOREIGN BODIES.

REMOVAL OF FOREIGN BODIES FROM THE EAR—THE EYE—THE NOSE—
FROM UNDER THE SKIN—OF SPLINTER FROM UNDER NAIL—AND OF
TIGHT RING FROM FINGER.

From the Ear.—If the foreign body be a hard one, as a bead or a small pebble, and not likely to swell when moistened, the ear should be gently syringed with warm water, at first with the head erect, and afterwards, if the foreign body has not come away, by inclining the ear well over the shoulder. If the body be a pea or any soft substance that might swell on the application of heat and moisture, the ear should not be syringed. In such case, and also when a hard body cannot be removed by syringing, an attempt might be made to free the ear by seizing the body with a pair of forceps, or by passing beyond it a piece of wire, *provided it be close to the external opening and quite visible. No attempt should be made to remove from the ear by wire or instruments any object that cannot be seen.* If the body can be readily seen and touched a piece of thin and flexible wire, such as is used for retaining the cork of a soda water or lemonade bottle, should be made into a loop, which, by gentle management, might be passed over the foreign body between this and the upper part of the ear passage. This attempt should be made carefully and slowly, and be discontinued at once if it cause much pain or give rise to any bleeding. The presence of a foreign body in the ear is less likely to result in serious mischief than any violent and prolonged effort to remove it by wire or forceps.

Another method of removing a visible, though fixed, foreign body is to dip a small camel's hair brush or a piece of cotton wool tied on the end of a thin stick into carpenter's glue, and to apply this to its exposed surface, when, in about half-an-hour's time, the glue has dried, the foreign body may be dislodged by gentle pulling.

If the attempt to remove the body, either by syringing or instruments has succeeded two or three drops of warm sweet oil should be poured into the ear, and the external opening be closed by a small plug of cotton wool.

The simplest way to remove an insect from the ear is to pour in warm oil while the patient is lying down on the opposite side. The drowned insect will float to the surface and may then be readily removed. If there be any difficulty in getting maggots away the ear may be syringed out with a weak solution of salt (one teaspoonful to a wineglassful of warm water).

From the Eye.—A small loose body behind the lower lid may be easily removed by drawing down the lid and raising the speck on the corner of a handkerchief or the tip of a small cone of paper. If the body cannot be seen there, the patient might be relieved by fixing his eye on a distant object and blowing his nose vigorously. If this fail the upper lid should be everted or turned inside out, by getting the patient to close his eye, and by placing a thin rod of any kind, such as a small penholder, or a pencil, across the upper part of the lid which may then be folded upwards by pulling gently on the eyelashes. When the lid is thus turned over on the probe the whole of its inner surface is exposed to view, and any foreign body that may be fixed there can now be readily removed.

If the foreign body is so embedded that it cannot be easily detached no further attempt should be made to remove it. Unless it has penetrated deeply it will come away by itself in the course of a few days, and inflammation may be prevented or much relieved by protecting the eye by cotton wool and a bandage, and by applying between the lids one or two drops of castor oil night and morning.

If a large foreign body, such as a piece of metal, has penetrated deeply and opened up the eyeball the patient should be sent on shore for surgical treatment at the earliest possible opportunity, as such injury, if not actively treated at once, might result in the loss not only of one, but of both eyes. In the meantime the eye must be carefully protected by wool and bandaging, and the patient be kept at rest and in darkness.

If lime get into the eye the pieces should at once be picked out or removed by thorough syringing with lime-juice and warm water (4 ounces of juice to $\frac{1}{2}$ pint of water). A case of burning of the eye by vitriol or any other strong acid should be treated by using a solution of carbonate of soda or of common washing soda (1 dram to 1 ounce of warm water).

In any case of injury to the eye by a foreign body or a caustic, such as lime or an acid, the application of a few drops of castor oil will give much relief and allay inflammation.

From the Nose.—A foreign body may be dislodged from the nose by closing the free nostril and the mouth and blowing

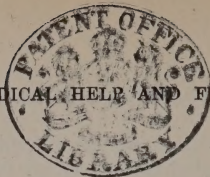
through the blocked side, by sneezing after a pinch of snuff or pepper, or by using the nasal douche (see p. 284), the stream of fluid being passed into the free nostril. If the body be fixed it may be extracted by forceps, or by passing behind a loop of wire or the bent end of a hair-pin. No attempt should be made to press it backwards.

If a leech should find its way into the nose it may be removed by injecting with a glass syringe a solution of common salt and warm water.

From under the Skin.—If a splinter of wood or a needle be thrust under the skin and out of sight, the wounded part—the hand for instance—should be tightly bandaged, or held above the head for about five minutes. An Esmarch's bandage, or a light band of some kind, should then be applied above the wrist so as to render the hand white and bloodless. The hard skin about the small wound or puncture should now be shaved away by a sharp razor until the end of the embedded body can be seen or felt, when it may be readily removed by seizing its end with a small pair of pincers.

A splinter under the nail may be extracted by paring and scraping away the free edge of the nail until the end of the foreign body is so exposed that it can be seized with forceps.

To remove a tight finger ring the finger should be evenly and firmly bandaged by a narrow strip of calico from the tip as far as the ring, under which the end of the bandage should be passed. After an interval of a few minutes the bandage should be quickly loosened, and then it will be possible by twisting the ring and by pulling it with the loop of bandage to make it pass along the finger. Another method is to raise the hand above the head and then to apply a narrow band of some elastic material or of moistened webbing from the nail towards the hand. At the end of five minutes, the hand having been kept up all this time, the bandage should be taken off. The ring will then very probably be found quite loose.



CHAPTER XIX.

INJURIES OF THE HEAD AND FACE.

Injuries of the Head and Face :—BRUISES AND CONTUSIONS. Wounds of the Scalp :—FRACTURES—CONCUSSION. Consequences of Head Injuries :—ERYSIPELAS—RULES TO BE FOLLOWED IN CASES OF HEAD INJURIES. Wounds of the Face :—BROKEN NOSE—FRACTURE OF LOWER JAW—WOUND OF THE TONGUE. Diseases of the Head and Face :—ULCERATION—OZÆNA—BLEEDING FROM THE NOSE—TOOTH-ACHE AND GUMBOIL—NEURALGIA—SWOLLEN TONGUE—SORE TONGUE—SCURVY—SALIVATION.

INJURIES OF THE HEAD AND FACE.

TREATMENT of head injuries should be guided by the following well-known and important maxim :—“ *Wounds of the head of the most trivial character are not to be despised, or of the most severe not to be despaired of.*” *

Bruises and Contusions vary from patches of slight discoloration to large swellings. The latter when situated in the scalp are often soft in the centre and very firm near the margin. If the skin be unbroken and the patient in good health the swelling will gradually disappear without any further bad symptoms, and no local treatment will be needed, save the application, for some two or three hours after the injury, of salt water. Rest, however, should be insisted upon so long as the swelling is large, for beneath it and concealed by it there may be a fracture of the skull with depression or “driving in” of a piece of bone.

Wounds of the Scalp.—When the wound is short—not more than 1 inch in length—and shallow, and its edges do not gape, it needs simply protection by a piece of cotton wool dipped in Friar’s balsam, and by lint, and a bandage. In deep wounds, the edges of which are widely separated, the raw surfaces, after complete removal of the surrounding hair, should be cleansed by a solution of carbolic acid (one teaspoonful to $\frac{1}{2}$ pint of water), or by boiled water, every particle of dirt or foreign material being removed. The edges should then be brought together by stitches (p. 117)—both needle and thread having been well boiled—and the seat of injury covered by lint saturated with Friar’s balsam, and, over this, by clean cotton wool and a bandage.

* Liston, *Commentaries*, p. 286.

In cases of scalp wound the bleeding is usually profuse, as the blood-vessels are large, run close to the surface, and do not close readily when divided. Even from a very small wound there may be free and persistent bleeding, if this wound be made in the course of one of the large arteries (Frontispiece). The flow of blood, however copious, may, in most instances, be effectually arrested by firm pressure, a thick and broad pad of lint or linen being applied over the immediate dressing, and kept in place by a tight bandage. Any attempt to stop the bleeding by cold water or by sponging will in most cases be found useless.

Fracture may occur, as the result of external violence, at any part of the skull. In simple fracture, when the skin remains intact, a well-marked hole or depression may often be felt. In fracture with a wound of the scalp a depression with jagged and broken margins of bone may be felt or seen at the bottom of the wound, and loose pieces of bone and portions of brain may also be exposed. The symptoms vary very much in different cases; the patient may suffer very little, or he may be insensible and convulsed (see *Concussion* and *Compression*, p. 158). A deep fracture on one side of the skull is liable to be followed by twitching and loss of power and movement in one or both limbs on the *opposite* side of the body. Fracture at the base of the brain and beyond reach is a very serious injury, the usual symptoms of which are deep insensibility (compression), occasionally associated with convulsions, bleeding from the ear and nose, and, in many instances, duskiness and swelling of the eyelids.

Treatment.—In cases of simple fracture, however mild the symptoms may be, the patient should be kept at rest and on low diet until the vessel reaches port. In compound fracture the wound should be carefully and thoroughly cleansed with boiled water or a weak solution of carbolic acid (2 teaspoonfuls of acid to a pint of warm water), and pieces of bone that are *quite loose* should be removed. The wound, if very large, should be partly closed by stitches and covered by lint, linen, or cotton wool dipped in tincture of benzoin, but an outlet must be left for the discharge of blood. If the patient recover from the immediate effects of a bad compound fracture of the skull, a large swelling resembling brain structure may protrude through the wound. This should be carefully dressed with tincture of benzoin or carbolic acid solution two or three times daily, but must not be roughly handled or compressed.

Insensibility is a very frequent result of injury to the head, and presents one or other of two distinct forms, concussion and compression.

Concussion, or stunning, may follow any severe injury to the head from a fall or blow, but often occurs without any external marks of injury. The patient is cold, pallid, and utterly prostrate, but can often be roused when spoken to and called by his name. The breathing is very slow, but not noisy, and the pupils of the eyes are very small. These symptoms will usually pass away in the course of a few hours, the return of consciousness being preceded by vomiting. In severe cases it may last for several days and be associated with restlessness, noisy delirium, and, perhaps, convulsions. In such instances, the patient may remain feeble, weak-minded, and forgetful for many months after the injury.

In **compression** the insensibility is much more intense, and the patient is completely unconscious and cannot be roused. The breathing is noisy and the patient snores. The skin is hot and the face may be flushed. Both pupils may be large, or one may be large and the other small. The stools and urine are passed as the patient lies. This condition is a much more serious one than concussion, and usually ends fatally.

Treatment.—Very little can be done either in concussion or in compression, except to keep the patient very quiet and clean. In a case of concussion, as he is often cold and there may be much collapse, he should be wrapped up in thick blankets or sheets, and, if the weather be cold, a large stone bottle containing hot water, or a proper hot-water bottle, should be placed at his side, care being taken to cover the bottle with a piece of flannel or some thick material so that the skin may not be burnt.

Consequences of Head Injuries.—*Erysipelas* frequently occurs after scalp wound. Redness of the skin shows itself at first near the wound, and afterwards spreads over the whole scalp and the face. The patient becomes very feverish and is sometimes delirious, "wandering in his talk" and very restless. This condition, though alarming, is not a very dangerous and hopeless one, provided the patient be young and free from any other affection. Five grains of calomel should be given as soon as possible, and, after this, a mixture of Epsom salts and bromide of potassium (Prescription No. VII.) twice or three times daily. The inflamed scalp should be dressed frequently with warm lead lotion (one teaspoonful to half a pint of hot water), and the face, if inflamed, be frequently dusted over with flour or starch or rice powder.

The scalp may become not merely red and inflamed, but much swollen, and separated from the skull beneath by "matter" (pus),

which may spread far and wide. The skin and the soft parts under the skin feel soft and "boggy," and on pressing the scalp with the finger, thick matter will probably be forced out in a stream from the original wound. This is a much more serious affection than simple erysipelas, and often proves fatal. If the scalp be much swollen and there be evidently much fluid under the skin, it would be right to make one or more cuts down to the bone, care being taken to avoid the large arteries marked on Frontispiece and to carry the knife parallel with, and not across, the course of the nearest blood-vessel. If there be an abundant discharge of "matter," the scalp should be covered by a layer of lint or linen dipped in weak carbolic acid lotion (one teaspoonful of acid to half a pint of water), and, over this, by a thick mass of soft oakum.

The worst and most dreaded danger in bad head injuries, especially in cases of deep scalp wound and fracture, is inflammation of the brain. The most marked symptoms of this serious consequence are—vomiting, intense headache, very hot skin, flushed face and eyes, intolerance of light, the eyelids being firmly closed, and dry and dirty tongue. The patient for a time is delirious, but soon passes into a state of deep stupor and insensibility. All that can be done in a case of this kind is to apply cold (ice or sea water) constantly to the *shaven* scalp and over the forehead, and to administer five grains of calomel, repeating this after eight hours if the bowels have not been freely relieved. If the patient be insensible, the powder should be put on the back of the tongue.

Rules to be strictly observed in cases of Head Injury.—Any unprofessional person who has to deal with a case of serious injury to the head, as, for instance, deep scalp wound, concussion, or fracture of the skull bone with or without wound of the skin, should do his best to ensure strict observance of the following essential instructions:—

1. *The injured man, even when apparently quite well and free from pain, should be kept at rest in a darkened bunk, care being taken to avoid cold draughts and strong sunlight.*

2. *The diet should be very spare, and consist, for some days, only of light fluids, as barley water and milk and water. Alcohol in any form to be regarded as poison.*

3. *Opium (laudanum, Dover's powder, paregoric) must not be given under any circumstance. This rule would apply also to morphia. If the patient be very restless, irritable, or noisy, bromide of potassium may be given in doses of 15 or 20 grains.*

4. *In cases of large scalp wound, of delirium, of high fever, and always in hot weather, the whole scalp should be shaved.*

5. *Constipation must be prevented and the bowels kept freely relieved by administering, at first, about 5 grains of calomel, and afterwards, every morning, half an ounce of Epsom salts in a small cupful of warm water.*

6. *In a case of prolonged insensibility or stupor, if there be grounds for believing that very little or no urine has been discharged, a soft catheter should be passed into the bladder. The bladder should be thus emptied at least twice in the twenty-four hours, so long as the patient cannot himself pass water.*

Wounds of the Face bleed very freely for a short time, and when long and deep may cause some anxiety and demand prompt attention. Sharp bleeding from a large wound in the cheek may be temporarily arrested by compressing the cheek below or inside the wound, between one finger passed into the mouth and the thumb outside. The main artery to the wounded side of the face may be compressed by applying the finger firmly over the lower border of the jaw-bone at a point about midway between the angle of the jaw and a line drawn downwards from the corner of the mouth on the same side (see Frontispiece). A large wound should be closed by stitching; if one of the eyelids be cut through, care should be taken to bring the edges evenly together by fine sewing cotton and a small needle. In a case of wound through the lip or through the cheek into the mouth, the *whole thickness* of the soft parts on each side of the rent should be taken up in the stitches. The artery to each lip runs just under its inner red surface, so that if only half the thickness of the wounded lip is included in the stitch, the vessel may continue bleeding. In sewing up a wound in the cheek the long ends of each stitch should not be cut away, but be used for securing over the wound a dressing of cotton wool or lint dipped in tincture of benzoin, which dressing may be allowed to remain for three or four days, or even until the wound has quite healed. Wounds of the face heal very quickly, and when once closed give very little trouble, provided the patient avoids exposure to cold and draughts.

Broken Nose.—The projecting bones of the nose may be broken by a violent blow. This injury generally causes bleeding from the nose and much bruising and swelling of the skin. The nose is often flattened and driven in, and unless the depressed pieces of broken bone can be raised there will be much subsequent disfigurement. An attempt should be made to prevent this by thrusting a thin piece of stick—the small and tapering end of a penholder, for instance—up the nostrils, and by tilting up the depressed fragments. It is often found very difficult, however, to keep these fragments in their proper position. The

swelling of the nose and eyelids produced in this injury may be removed by applying ice or cold sea water. If there be much discharge from the nostrils these should be syringed with a very weak solution of Condyl's fluid (10 drops to half a pint of warm water).

Fracture of the Lower Jaw.—This is a very awkward injury, as it often causes much deformity, is difficult to treat satisfactorily, and may be followed by abscess and long-continued discharge of "matter" (pus), either from the mouth or from a hole in the chin.

Symptoms.—The symptoms are:—Bleeding from the mouth, dribbling of saliva, grating or crepitus when the jaw is moved, and irregularity of the line of teeth. The gum is torn, and one or more teeth will probably be found quite loose. The patient cannot move the jaw, and has much difficulty in speaking. It will in most cases be found impossible or very difficult to remove the deformity and to restore the proper curve of the teeth.

Treatment.—The lower row of teeth should be pressed against the upper row and be retained there by two broad bandages, one carried *under* the chin and tied on the *top* of the head, the other carried from the *front* of the chin and tied behind the neck. To prevent these slipping they may be stitched together in front, and bound together behind the head by "cross" pieces of tape or narrow strips of linen. The patient must be fed on fluids, and the mouth be very frequently washed out with a weak solution of Condyl's fluid (see above). If any of the teeth be very loose and prevent the jaws from coming together, they should be removed.

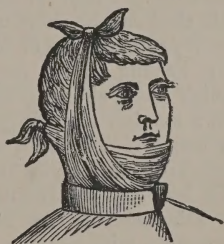


Fig. 33.—Bandage for Broken Jaw.

Wound of the Tongue may be caused by the teeth in a strong epileptic fit, and also by the broken stem of a clay pipe being driven forcibly into the mouth through a fall or blow. The bleeding is very free for a short time, but will soon cease if the patient can keep his mouth well open to allow the access of cold air. So long as the wound remains open the patient should live on fluid diet, and abstain altogether from smoking. If there be much swelling of the tongue, ice, if it can be obtained, should be almost constantly sucked. The wound in the course of healing often becomes foul, and there is much discharge from the mouth of thin purulent "matter" mixed with saliva. For this

reason the mouth should be frequently cleansed by a solution of Condyl's fluid (see p. 161), or a gargle of alum (10 grains to 1 ounce of water).

DISEASES OF HEAD AND FACE.

Head Lice (see Chapter xxviii.).

Obstinate Ulceration of the scalp is in most instances a form of tertiary syphilis, and when associated with other external signs of this disease (see Chapter xxvii.), should be treated by giving, as an internal remedy, iodide of potassium in doses of from 5 to 15 grains to an ounce of water. The scalp should be kept clean and shaven around the ulcers. Iodoform should be dusted lightly over the ulcers every morning, or, if this be not available, simple ointment may be applied, spread on lint or linen. Deep and persistent ulcers of the scalp often expose bare and dead bone. In a case of this kind the patient should be kept idle and at rest.

Ulcers on the face may be due to syphilis, to cancer, or to scrofula. They are usually chronic or more or less passive, and all that can be done on board ship is to keep the sores clean and well-protected from the air. A dry round ulcer on the lower lip, having a hard rim and covered on its surface by scales or a thick scab, should receive some attention. A sore of this kind in a smoker over 45 years of age will very probably prove to be a cancer. The sore should be dressed with simple ointment, smoking should be discontinued, and the man be sent on shore for hospital treatment as soon as the ship reaches port.

Disease of the Bones of the Nose (Ozæna) is not uncommon with seamen, particularly those who have had syphilis and led intemperate lives. This affection is not only distressing to the patient himself but also to those about him, as the main symptom is a constant discharge of most offensively smelling fluid. The nose is often swollen, and the skin over the bridge red and inflamed. The patient, who does not perceive the bad odour himself, is usually pale and feeble.

Treatment.—An attempt ought to be made to cleanse out the diseased nostril twice or three times every day by injecting a lotion (Prescriptions 1, 2) by means of a glass syringe, or by contriving to make up the simple and very useful apparatus known as the "nasal douche" (see p. 284).

Bleeding from the Nose, when caused by a blow, will in most instances soon cease and give but little trouble. It often, however, comes on without any injury, usually either in young lads or in older persons suffering from advanced kidney disease,

from jaundice, and from purpura or scurvy. In a young and healthy subject it will very probably do good rather than harm, but in those who have been more or less enfeebled by disease it is likely, if profuse and obstinate, to cause much anxiety. It may continue for several hours or it may come on "now and again," the attacks being repeated over several days.

Treatment.—The patient should lie on his back with the head raised on a pillow, and the arms also raised at full length above the head; cold, by means of ice if possible, should be applied to the forehead and the back of the neck. If the bleeding still continues the nostrils should be injected with iced water or cold sea water by means of the nasal douche (see above) or a glass syringe. Much difficulty will be experienced by a non-professional person in plugging the back of the nose, and if the front part of the nose only be plugged the bleeding will very likely still go on from behind, and not be revealed until after a large amount of blood has passed down the back of the throat and the gullet into the stomach. Vomiting will then take place and a large amount of very black blood be brought up. During and after the bleeding the patient should take a liberal fluid diet (soup and milk), and, as a medicine, tincture of steel and quinine (see Prescription No. IV.).

The following plan has been recommended for trial in cases of troublesome bleeding from the nose:—The patient to stand up and sharply elevate both arms above the head, and to retain them in this position for five minutes or longer; or to raise only one arm—that corresponding to the side of the nose from which all or most of the blood flows—and with the fingers of the opposite hand to squeeze the nostril.

Toothache and Gum-boil.—If the aching tooth be decayed or broken away, a small piece of cotton wool dipped in strong carbolic acid, creosote, or oil of cloves may be inserted into the hollow. The application to the gum, by means of a camel's hair brush or the tip of the finger, of a mixture of equal parts of tincture of iodine and laudanum will often be found very useful in cases in which no visible hollow can be seen in the tooth.

Gum-boil is usually a small and painful abscess connected with the fang of a decayed tooth. It will in the course of two or three days discharge into the mouth, and needs no treatment. The inflammation sometimes spreads along the side of the lower jaw and under the cheek, forming a large, red, and very painful swelling of the face and neck. As this irritation is apt to cause much suffering and high fever, the patient should rest, be fed on spare and fluid diet, and foment the swelling frequently with hot

sea water. The pain and swelling subside rapidly after the abscess has burst, which it does usually inside the mouth. As long as there is a discharge the mouth should be washed out from time to time with a weak solution of Condy's fluid (10 to 15 drops to half a pint of cold water).

Neuralgia.—In cases of severe aching of several apparently healthy teeth in both jaws, with pain over one side of the face and on the forehead, it would be well to try if any good can be done by giving quinine in doses of 3 or 5 grains three times daily. The aching, unlike ordinary toothache, will probably be intermittent, ceasing for a time and suddenly returning. This form of toothache is often met with in those who are, or have been, affected with "fever and ague."

Swollen Tongue.—Sometimes, in consequence of scalding, the bite of a bee or wasp, or some other injury, or it may be without any definite cause, the whole tongue may suddenly swell to a large size, so as to project from the mouth and to interfere seriously with breathing. In such cases the patient should be freely purged and suck ice or sip cold water. If the swelling increase and become alarming, several small cuts should be made on the top of the tongue with a clean lancet, and the mouth be washed out frequently with warm water.

Sore Tongue is a common affection with seamen. It may be due to excessive smoking, to the irritation of a broken tooth, or to syphilis. In the syphilitic form the upper surface of the tongue presents smooth white patches and oval sores, and is often marked by deep fissures. The worst cases of bad tongue are those in which a part of this organ has been eaten away by a deep, ragged, and foul ulcer. Such ulcer is usually the result either of tertiary syphilis or of cancer. If the ulcer be very tender, and situated on the edge and not on the top of the tongue; if one or more hard swellings (enlarged glands) can be felt below the jaw on the same side as the ulcer; and if the man be above the age of fifty, the disease will very probably prove to be cancerous.

Treatment.—In every case of inflamed or sore tongue, the man, if given to the use of tobacco, should at once abstain from both smoking and chewing. In simple ulceration due to disordered bowels or to local irritation, a mixture of chlorate of potash and Epsom salts may be found beneficial (Prescription VIII.). Honey, treacle, or sweet oil, if taken into the mouth and retained there for a few minutes, will soothe the inflamed surface and give relief. In the milder forms of syphilitic ulceration, 3 grains of iodide of potassium should be added to the

above mixture, and the sores should be lightly touched every morning with a stick of lunar caustic or, preferably, with a crystal of blue vitriol. In a case of deep and destructive ulcer of the tongue, iodide of potassium should be given in doses of 10 grains or more, if the patient can take this drug without being distressed (see Chapter xxx.). If the disease be due to tertiary syphilis, the iodide very probably will cure it, and certainly give much relief. The mouth should be frequently washed out by a weak solution of Condyl's fluid (20 drops to a pint of warm water).

In most cases of **Scurvy** (p. 78) the gums are swollen and tender, and the teeth are sometimes almost completely covered by large red and soft swellings which bleed freely when touched. This condition soon disappears, together with the other symptoms of scurvy, on the supply of a good diet with fresh vegetables, or lime juice. The tenderness of the gums may be relieved by sucking alum.

Salivation from mercury is seldom seen now except in a mild form, but may occur and present very serious aspects unless this drug in any of its preparations be administered with great care and frequent supervision. One of the first symptoms is a "coppery" taste in the mouth. The gums and tongue soon become swollen, tender, and dirty. The breath has a characteristic and bad odour. As the name of this disease implies, the mouth is very "watery" and there is a constant dribbling of saliva from the lips. In bad cases small sores form on the tongue, the gums break down into foul ulcers, and the teeth become loose. The patient, for a time, may become deaf.

Treatment.—In every case of salivation, however mild it may be, the use of mercury should of course be stopped at once. The patient should be fed on a nutritious, but fluid, diet, with an extra supply of lime juice, and take great care to avoid exposure to cold and wet. The bowels should be freely relieved by Epsom salts (2 drams to a wine glass of warm water) every morning, and chlorate of potash (8 grains to a wine glass of water) should be given every three hours. The mouth should be frequently cleansed by a lotion of carbolic acid (one teaspoonful of the acid to a pint of water).



CHAPTER XX.

INJURIES AND AILMENTS OF THE NECK.

Injuries of the Neck:—WOUNDS—AIR-INFLATED NECK. Diseases:—STIFF NECK—CARBUNCLE—SWELLINGS IN THE NECK—ABSCESSSES—TUMOURS.

INJURIES.

Wounds.—Accidental wounds of the neck are rare. When superficial they should be treated like wounds on other parts of the surface of the body; if not more than 2 or 3 inches in length by strips of adhesive plaster; if long and gaping widely by stitching. If the wound be a deep one it would be better not to apply stitches, but to cover the raw surface by simple ointment spread on lint. A deep wound of the neck, whether long or short, may be a very serious one if it has been made over one of the large vessels which are to be found in this region. The most dangerous regions are—the root of the neck and just above the collar bone; the slight depression extending on either side along the windpipe from the top of the breast bone to the angle of the lower jaw; the parts immediately below and behind the ear. In the course of a line drawn from the angle of the jaw to the middle of the collar bone there runs a large vein (external jugular), but bleeding from this may be readily stopped by applying a small pad of lint over the wound, and fixing this in its place by firm bandaging. A rapid and profuse flow of bright red blood from any of the other regions will, in many instances, be found quite beyond the scope of any non-professional treatment, and speedily prove fatal. If a large spurting vessel be seen at the bottom of a large wound an attempt should be made to seize it by forceps and to tie it with a thread, or strips of lint may be stuffed into the cavity and be firmly retained by pressure kept up by the fingers of two or more attendants for three or four hours. If there be no return of the bleeding care must be taken not to disturb the lint, but to allow this to come away by itself.

Wounds of the neck are usually the results of suicidal or homicidal attempts. Of these the most frequent instance is that known as cut-throat. The attempt is sometimes an abortive one, and the only result of it is one or more jagged skin wounds, which may be readily treated by adhesive plaster, simple oint-

ment, or a few stitches. In the usual form of cut-throat, however, there is a long and deep gash across the upper part of the neck, just above the top of the windpipe. The bleeding is always free, and sometimes rapidly fatal. If the flow of blood soon ceases, or has been arrested by pressure, or by the application of thread to any spurting vessels, the edges of the wound on each side should be brought together by stitches, and the middle third of the gash be left open. This should be covered by a clean sponge dipped in hot water, or by a handful of dry but warmed cotton wool. As the patient lies in his bunk his head should be well raised on a thick and firm support, so that the chin can be brought down towards the top of the chest. The patient should, of course, be watched, and as he may, very probably, have been much weakened by bleeding, mental excitement, and also by intemperate habits, it will be necessary to support his strength by alcohol and strong fluid diet. This, however, will be found difficult, as any fluid that he may attempt to swallow may run out through the wound, and some of it into the windpipe. In such a case an attempt should be made to feed the man by the lower end of the bowel, and to throw up, every three or four hours, by the use of an enema syringe, 2 ounces of strong beef tea or strong soup mixed with half an ounce of brandy.

A pointed or angular body, as, for instance, a fish bone, or a plate with artificial teeth, may become fixed in the gullet, and, if allowed to remain there, cause much trouble, and even lead to a fatal result. If a careful examination of the throat with the finger fail to reveal or to loosen the fixed body, the patient, if he continue to complain of pain and uneasiness, should be kept at rest. If there be reason to believe that it has become detached and passed into the stomach the diet should consist chiefly of dry bread and potatoes.

Air-Inflated Neck (*Emphysema*).—In some cases of injury to the chest and of broken rib the neck becomes “blown out” with air, a large soft swelling being formed, which, when touched and handled, crackles under the fingers. This swelling usually subsides in the course of two or three days, and, unless it be very large, need not cause any anxiety. Should the patient, however, become very blue in the face and suffer from symptoms of suffocation, life may be saved, and certainly no harm be done, by making several punctures at different parts of the neck. In each puncture the lancet should be passed well into the skin.

DISEASES.

Stiff Neck may be due to a cold draught or to muscular strain. It is usually painful and troublesome for a time, but will soon pass off if the neck be kept warm by a thick wrapper, or the back of it be covered by a thick plaster.

Carbuncle is frequently met with on the back of the neck, where it forms a large red and very painful swelling, marked on its surface by numerous *yellow* heads which burst and discharge thick "matter" and white pulpy shreds. The patient is generally much enfeebled by pain and constitutional disorder. After the *white* heads have given way and there is a free discharge, the pain is much relieved, but a very large and deep sore is left, which heals slowly.

Treatment.—The patient should be put on a generous diet, with beer or stout (two pints daily). Before the carbuncle has burst, and whilst the pain is very severe, an opium pill (Pil. Sapon. Co., grs. v.) should be taken two or three times in the twenty-four hours. The red and inflamed surface should be frequently bathed with hot water, and in the intervals be covered by simple ointment spread on lint or linen, and over this by a thick pad of cotton wool. The use of the lancet, whether the cuts be small or large, is often followed by much bleeding, and in most cases may be dispensed with, as the matter formed within the carbuncle will sooner or later find its way to the surface. The large sore formed after the separation of the thick yellow sloughs should be dressed with some Basilicon ointment (p. 37) and frequently cleansed with a weak solution of carbolic acid (two teaspoonfuls to half a pint of water).

Swellings in the Neck.—The most frequent forms are enlarged or so-called scrofulous glands. These are generally very movable, and are situated behind and below the lower jaw and along the side of the neck. There are, in most instances, two or more of these swellings, and the neck is sometimes marked by the scars of old abscesses. An enlarged gland may be quite solid, or it may have broken down into an abscess, in which case the skin over it will be red and thin. Whilst there is no discharge or "running" from any sores in the neck, and the swellings are painless and quite solid, the patient, if in other respects a strong and healthy man, need not be regarded as incapable of doing his full share of work. Indeed, provided he be well fed, active exercise in sea air will be more favourable to his recovery than an idle life on shore.

Abscesses in the neck, whether formed by enlarged glands

or due to other causes, should be treated like similar swellings in other regions (see p. 103). If the swelling be quite soft and the skin over it thin and red, it may be opened by a small cut with a lancet. In some cases the abscess is deep-seated and behind important structures. The neck in such cases is generally much swollen, and there may be great difficulty in swallowing and also in breathing. The use of the lancet under such circumstances would be likely to do much harm, and an incision, even though deep, might not reach the collection of "matter." All that can be done in these serious cases is to foment the neck very frequently with hot water, or to apply poultices.

Tumours.—Besides enlarged glands there are many other forms of tumour that may occur in the neck. Although some of these are of a cancerous or malignant nature, and increase rapidly in size, the patient may generally be left without any active treatment until his ship reaches a port where he can be taken into a hospital. In every case, however, of tumour of the neck, especially if it be just above the breast or collar bone, or along the line of the carotid artery (see Frontispiece), the swelling should be closely examined. If there be an incessant "heaving" or "wavy" motion when pressed, and a feeling as of an exaggerated pulse, the growth will very probably prove to be a diseased and dilated artery (Aneurism, see p. 100). In such a case the patient should be strongly urged to keep at rest in his bunk, and the swelling, if it increase rapidly in size, should be covered by an ice-bag (see Chapter xxxi.). The diet should be a very spare one, consisting of about 6 ounces of meat, 5 ounces of biscuit, and half a pint of milk or one pint of water daily. If the patient be restless and irritable under such treatment, bromide of potassium (30 grains to a wine glass of water) should be given every night. The serious nature of his disease should be impressed on him, and every effort made to induce him to submit patiently to these somewhat severe restrictions.



CHAPTER XXI.

INJURIES OF THE UPPER EXTREMITY.

Contusions. Wounds :—POISONED WOUNDS OF THE HAND AND WHITLOW.
Fractures of the Upper Limb :—ARM BONE—SPLINTS—AT AND
 BELOW THE ELBOW—FOREARM—WRIST—BONES OF THE HAND.
Dislocations in the Upper Limb :—SHOULDER—SIGNS—TREAT-
 MENT—ELBOW JOINT—THUMB.

Contusions.—Much bruising and swelling at any part of the upper limb, particularly about the shoulder and elbow, will in most instances be accompanied by fracture or dislocation, the usual and characteristic symptoms of which are, for a time, marked by the collection of blood. If there be much swelling around an injured elbow, the forearm should be kept bent at almost a right angle to the arm, so that, should stiffness of the joint result from the injury, the hand may be left in the least unfavourable position.

Wounds.—A reference to Plate I. will show that the parts of the upper extremity in which deep wounds would cause most bleeding, are those which are instinctively protected in the attitude of self-defence. A stab in the armpit might be very serious, as this space is traversed not only by the large artery and vein which supply the whole limb with blood, but also by numerous important branches. The single large artery (brachial) which passes from the armpit to the front of the elbow, though very near to the surface, is fairly well protected from its situation, which is along the inner side of the arm, and corresponds to the inner seam of a coat sleeve. Just below the elbow this vessel divides into two large branches, one of which (ulnar) runs down the inner side of the forearm, the other (radial) along the outer surface almost as far as the ball of the thumb. This last vessel as it approaches the wrist comes very close to the skin, so that its beating, or pulse, can be easily perceived. For this reason the beating, or pulse, which occurs in all large arteries, though it cannot be readily made out in those which are covered by thick flesh or muscle, is usually felt for at the wrist about one inch and a-half above the ball of the thumb. The two arteries (ulnar and radial) unite in the palm of the hand, where they form two arches, from which branches are sent off to the

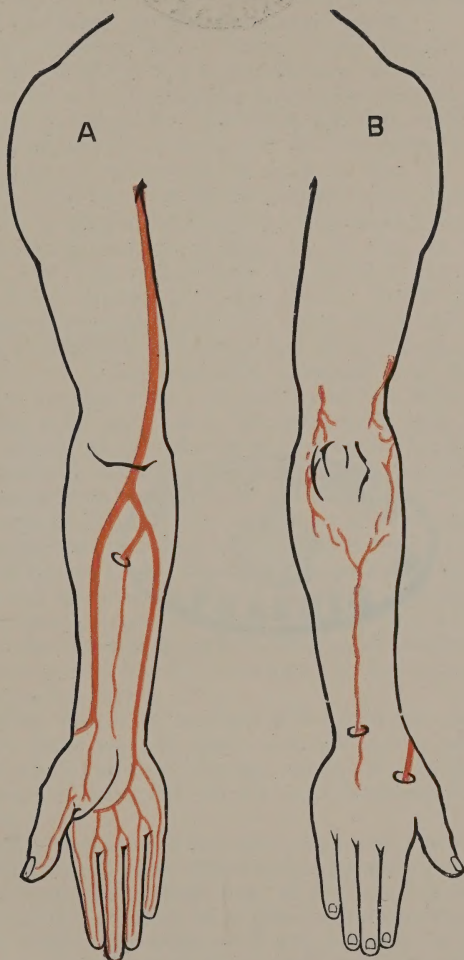


PLATE I.—Arteries of Upper Limb.
A, Front View. B, Back View.



fingers. Thus the back and outer parts of the arm, and the backs of the forearm and hand, are free from large vessels.

In case of free bleeding from a wound in the armpit, a large and firm pad, one of folded canvas for instance, should be thrust into this hollow so as to press on the wound, and the arm be very closely bandaged to the chest. For other methods, see p. 135.

In bleeding from the inner surface of the arm in the course of the brachial artery, if the wound be small so that the injured vessel cannot be seen and tied, the circulation in the limb should in the first place be stopped by applying an Esmarch's tourniquet high up above the wound, or, if there be no time for this, by squeezing the arm very tightly with the hand, or by tying a handkerchief firmly around it. The wound should then be covered or plugged by a small pad of dry lint, about half an inch square. Over this another and larger pad should be placed, and still others, the size being gradually increased until from ten to twenty have been piled up. On the top of this collection of pads some thin solid body, as a flat cork, or a thin circular disc of wood, should be placed, and the whole be firmly bound down by a moistened bandage. The whole limb should then be carefully bandaged from the fingers to the armpit, the tourniquet being now removed. The patient should be kept at rest on his back, with the injured arm raised well above the level of the body. If there be no return of the bleeding, the pads and bandaging should be allowed to remain for about two days, or even longer, if the man can bear the pressure. Attention should be paid to the hand from time to time, for if it become much swollen, or the fingers be blue and cold, it will be necessary to loosen or, it may be, to remove the bandages.

If the bleeding wound be in front of the elbow it should be treated in the same way, by pads and bandaging, after the application of which another bandage should be applied, so as to keep the arm well bent, the hand almost touching the front of the shoulder.

Deep wounds of the palm of the hand often give much trouble on account of bleeding. One of the arches formed by the union of the arteries from the forearm may be wounded through the slip of a knife, or the breaking of a glass or earthenware vessel in the hand in a fall. An attempt should be made to stop the bleeding by applying pads over the wound, which should be first secured by a bandage, and then pressed, and then kept in place by getting the patient to grasp some solid body—for instance, a rounded piece of wood about 4 inches long and $2\frac{1}{2}$ inches in diameter. The fingers should be bandaged down over this, and

the whole limb well raised above the level of the recumbent body.

It is a very important point in cases of free bleeding from the arm or hand to take care that the limb be not allowed to hang down. Whilst the man is sitting or standing the arm should be supported in a sling; whilst he is on his back it should be raised above the chest or head and be retained for some hours in this position.

The above instructions apply to cases of arterial bleeding—those in which there is free and rapid flow of bright red blood. In most cases of venous bleeding in which the blood runs away less freely and is of a dark colour, the wounded vein can be readily closed by the pressure of a single pad, and a lightly applied bandage, and there will not be any necessity to bandage the whole limb or to elevate it.

Poisoned Wounds of the Hand and Whitlow.—In seamen, as in those employed in manual labour on shore, a small wound, or even a mere prick, of the hand or one of the fingers is very apt to “fester,” and to result in swelling and inflammation. In such cases the wounding object is usually a dirty or poisonous one, and the subsequent mischief is due to the inoculation of the tissues of the hand with some irritating or poisonous material. Thus it may be caused by the prick of a rusty nail; or of a dirty knife, such as one used by the butcher or in cutting live fish; or by a fish bite or the prick of a fish spine; or, again, by a wound or scratch of the knuckle from the tooth of another man. The extent and severity of the mischief vary in different cases from a small festering sore or a boil to painful swelling of the whole arm.

Treatment.—When the wounded part is merely sore and irritated all that is needful is to protect it by a strip of lint smeared with simple ointment. A prick of the hand or finger is often followed by a large and very tender bleb or blister. This should be punctured by the point of a clean needle previously dipped in boiling water. Some thin “matter” will be let out, and the sore, if carefully protected by lint or cotton wool, will soon dry up and heal.

A prick or small wound, without causing any mischief in the hand, may be followed by pain and a feeling of heaviness in the arm, and, perhaps, by a tender swelling just above the elbow on the inner surface of the limb, or in the armpit. Along the surface of the arm one or more narrow red streaks may be seen running upwards towards the elbow, and even beyond this to the shoulder (inflamed lymphatics). In treating this the hand

and arm should several times in the course of the day be immersed for ten or fifteen minutes in hot water, and, during the intervals, be covered by cotton wool or clean flannel. The limb, so long as it is painful, should be carried in a sling. The patient should not be confined to his bunk, but, whilst avoiding undue exposure to cold, get as much fresh air as he can. The diet, without being spare, should be light, and consist mainly of fluids (milk, beef tea, soup).

The end of the thumb or of one of the fingers may become hard, much swollen, and very painful. At the same time the patient fails in health and vigour, and suffers from want of sleep.

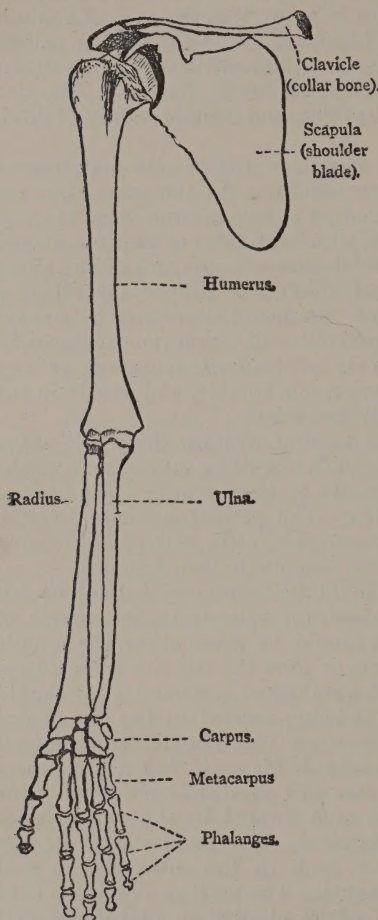
Treatment.—The swelling, which is a form of whitlow, should be deeply incised along its middle towards the end of the finger—not from side to side—and afterwards dipped for about a quarter of an hour in hot water. It should afterwards be covered by lint frequently dipped in carbolic acid lotion (one teaspoonful to half a pint of water). This local affection, though it may not spread, will probably give much trouble, and result in the death of the bone at the end of the finger.

In another and more severe form of whitlow the whole finger becomes inflamed and swollen. The swelling may extend to the palm, and even beyond the wrist to the forearm. The back of the hand also becomes swollen. The patient becomes feverish and depressed, and suffers much pain. He will probably complain of a tender swelling in the armpit (inflamed gland).

Treatment.—The hand should be frequently bathed in hot water, and, if the swelling does not subside in the course of twenty-four hours, a deep cut should be made along the middle of the inflamed finger, towards or from the tip, not from side to side. Also, if there be much swelling of the hand a cut should be made in the palm, the knife being carried in the line of one of the fingers, and never between two fingers, and especial care being taken *not to cut nearer to the wrist than a line drawn across the hand midway between this joint and the roots of the fingers*, in order to avoid the arch formed by the two arteries which come down from the forearm. The hand should be frequently bathed in hot water, and, in the intervals, be well fomented by hot and moist flannel. The patient should be kept at rest, freely purged by Epsom salts, allowed an addition of malt liquor or spirits to a fluid diet of milk, soup, and beef tea, and sent on shore for professional treatment as soon as the vessel reaches port. If the swelling has extended to the forearm, the hand will probably be permanently disabled in consequence of shortening and stiffness of its sinews.

The worst result of a poisoned wound of the hand is extreme swelling, with redness of skin, extending rapidly along the whole limb to the shoulder (diffuse cellulitis). This condition is accompanied by high fever and much general disturbance.

Treatment.—Cut should be made whenever the skin becomes dusky, and the parts beneath feel soft and boggy. The arm should be well fomented, and afterwards, if there be much discharge, enclosed in large pads of oakum. The patient should be kept at rest, and be supported by abundance of beef tea, milk (if available), and brandy.



FRACTURES OF THE UPPER LIMB.

Fig. No. 34 shows the bones of the upper limb, from the shoulder to the tips of the fingers. There is a single long bone (*humerus*) in the arm between the shoulder blade and the elbow; between the elbow and the wrist there are two long bones (*radius* on the outer or thumb side, *ulna* on the inner or little finger side); at the wrist there are eight small bones (*carpal*) arranged in two rows, below which will be seen nineteen long and thin bones, three in the thumb and four in

each of the fingers. The bones of the first row, which are buried in the flesh of the palm, are called *metacarpals*, those of the free and movable fingers are called *phalanges*.

Fractures of the Arm Bone (Humerus).—When the upper end of this bone has been broken, much difficulty is often felt, even by experienced surgeons, in making out the nature of the injury. There is usually much swelling about the shoulder, and the least touch causes intense pain. In many cases of severe injury to the shoulder there is a risk of overlooking a dislocation, and of leaving the upper end of the arm bone out of its proper position, and the limb much crippled. If grating (crepitus) can be distinctly felt on moving the arm, and if the elbow hangs by the side of the chest, or can be readily placed there, the injury should be treated as a fracture. The elbow should therefore be drawn away from the side, and the injured arm and shoulder be supported on a pillow or some other soft body (a portion of clothing, a folded sheet, a thick piece of folded canvas), and the swollen parts be kept constantly moistened by layers of lint, or linen saturated with cold water or spirit lotion (Prescription No. 3). When the swelling has subsided, and the injured man feels able to move about, the arm and elbow should be bandaged to the side of the chest, and the hand and wrist—not the forearm—be supported by a narrow sling. There will probably be shortening of the upper limb after union of the fracture, but this will not necessarily interfere with its usefulness.

Fracture of the arm bone at its lower end is a very difficult injury to make out, and to treat satisfactorily.

In this, as in every injury near a joint, it is necessary in the first place to be sure that there is not a dislocation.

In fracture near the elbow there is usually grating, much swelling and bruising about the elbow, and shortening of the arm between the tip of the shoulder and the elbow. In dislocation of the two bones of the forearm on the back of the lower end of the arm bone, there is a very distinct angular prominence behind and above the elbow, and the injured arm is not shorter than the other. Fracture, as a rule, is caused by a fall on the elbow, dislocation almost always by a fall on the palm of the hand. In complicated and very severe cases, however, there may be both fracture and more or less dislocation.

Treatment.—The injured limb should be bent at the elbow almost to a right angle. For the first few days it should rest on a pillow or some other soft support, and the swelling be reduced by the application of cooling applications (cold water, or spirit lotion, see above). After this the hand and forearm should be bandaged, and the whole limb from the armpit to the wrist fixed on an angular splint (Figs. 35 and 36) by bandage, handkerchiefs, or narrow straps. A bad fracture extending into the elbow is

almost certain to be followed by stiffness of this joint. It is advisable, therefore, that the forearm be kept in the position in which it is likely to be most useful in the future.

If the arm bone be broken at or near its middle the limb will be shortened, much distorted, and loose and movable at the seat of injury, where, if the bone were sound and intact, there would be no joint. The treatment should consist in bandaging the forearm, in straightening the broken arm,

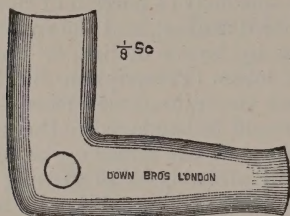


Fig. 35.—Splint for Arm.

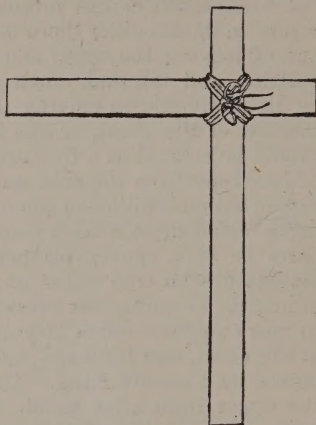


Fig. 36.—Splint for Arm.*

and in applying two or more short and well padded splints (Fig. 37). It is best to apply four short splints, one, the

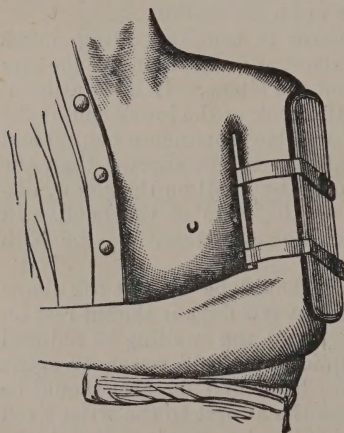


Fig. 37.—Splints for Arm.

longest, to the outside, one, the shortest, to the inner side, and the other two back and front. They should be kept in place either by bandages or by folded handkerchiefs. When the injured man is able to move about the hand and wrist—*not the forearm*—should be carried in a narrow sling.

A broken arm renders a man incapable of work for about seven weeks. If there be no other injury, and the fracture be a simple one—that is, if the skin of the limb be unbroken—the patient will, in most instances, get strong and well in this period. There are,

* This is an “extempore” splint, formed by tying firmly together two thin and narrow pieces of wood. Cantlie, *Accidental Injuries*.

however, two risks; the fracture may set itself very slowly, and take months instead of weeks to unite; and after this injury the hand sometimes becomes bent at the wrist and useless, in consequence of injury to one of the large nerves running down the arm.

Fracture at and below the Elbow.—The bony projection (*olecranon*) at the back of the elbow, which moves downwards and upwards when the forearm is bent and straightened, is sometimes broken away from the inner bone of the forearm, of which it forms a part, by a fall on the back of the elbow. The only marked symptoms are a distinct gap and free movement of the fragment of bone from side to side. There is very little, if any, deformity of the front of the elbow, and the forearm can be bent and straightened freely and without much pain. In dislocation at the elbow (see p. 181) there is much deformity, the forearm is shortened, and the elbow cannot be moved without pain.

Treatment.—A long straight splint extending from the shoulder to the wrist should be applied and bandaged to the *front* of the limb. The back of the elbow should be left uncovered by the bandage, so that cold water or cooling lotion may be applied to the seat of injury. The detached piece of bone will not join to the rest of the ulna, but by the above application, which should be kept on for about three weeks, the width of the gap may be much reduced. The future usefulness of the limb will not be much affected.

The Bones of the Forearm are frequently broken either by falls, or by blows on the back of limb.

Signs.—When both bones are broken there is deformity of the forearm, and also looseness or free movement at a part where there is no joint, and where such mobility ought not to exist. Grating can also be distinctly felt and heard on moving the injured limb. When one bone only is broken there is much less deformity, as the forearm is kept straight by the unbroken bone.

Treatment.—A long and well-padded splint should be applied to the front of the forearm from just below the elbow to the tips of the fingers; and a shorter splint, also thickly padded, to the back of the limb as far as, but not below, the wrist. These two splints should then be secured by a bandage or by two or three folded handkerchiefs. In applying the splints the hand should be so fixed that the outside of the thumb is directed towards the chin of the patient. The limb should then be carried in a broad sling. In any ordinary case the use of the limb ought to be completely restored at the end of the fifth week.

A very awkward and disabling injury, known to surgeons as Colles's fracture, may be produced near the *wrist* by a fall on the palm of the hand. The peculiar deformity of this injury, which is a fracture of the lower and expanded end of the outer bone of the forearm (radius) is represented in Fig. 38. It is very difficult, and in many cases impossible, to overcome this deformity, and the joints of the hand and fingers often remain stiff and useless for many months after the injury.



Fig. 38.
Colles's
Fracture.

Treatment.—The fracture may be treated either by a "pistol splint" (Fig. 39) applied to the back of the hand and forearm, or by two short splints applied to the back and front of the arm, but not reaching below the wrist, so that the hand may be left free and allowed to fall down.

Fractures of the **Bones of the Hand** are not frequently met with. The injury in most instances is received in a fight and by striking the knuckles against some hard object. There is much swelling on the back of the hand, and grating of the fragments can usually be felt. The injured hand should be bandaged to a short splint applied to the palm, the thumb being left free; and be carried in a sling. The

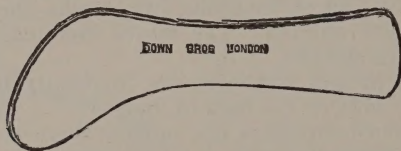


Fig. 39.—Pistol Splint.

broken bone unites quickly, so that the hand is sound and strong by the end of the fourth week.

In cases of **Compound Fracture** of the bones of the upper extremity, in which there is an external wound, the treatment should vary according to the nature and extent of the injury to the skin and flesh. If the wound be a small one and there be but little swelling or bleeding, the opening in the skin should be covered by a piece of lint or cotton wool dipped in Friar's balsam, and the broken limb be set in splints. The wound, however, should not be pressed upon, but, if possible, left uncovered by splint and bandage, so that it may be dressed every second or third day. If the wound be a large one and the flesh is much torn and freely exposed, the limb

should be laid on a pillow and be carefully cleansed and syringed out with a solution of carbolic acid (four teaspoonfuls to a pint of water), and be kept constantly covered by lint dipped in this solution. In cleansing a fresh wound of this kind, care should be taken to remove dirt and foreign material, and also, *if these be quite loose*, any fragments of bone. The elbow should be kept bent, as this is the most comfortable position, in cases of fracture near this joint, while it places the hand and forearm in the least unfavourable condition with regard to the future usefulness of the limb.

For hints on the treatment of persistent and profuse bleeding from the wound in cases of compound fracture, see pp. 132, *et seq.*

In cases of compound fracture and crushing of the fingers, no part should be removed unless it be hopelessly destroyed. If the crushed portion be attached only by a strip of skin, this may be divided with a clean knife or scissors. The injured fingers, after bleeding has stopped, should be soaked for three or four hours in warm water, and then be dressed with strips of lint saturated with carbolic acid lotion (see above). The dressing should be frequently renewed, and the patient, if it be feasible, should be kept in bed, in order that he may avoid exposure to cold, and that inflammation and swelling of the hand may be prevented.

DISLOCATIONS IN THE UPPER LIMB.

Dislocation at the Shoulder, or displacement of the rounded upper extremity of the arm bone from the shallow oval depression on the shoulder blade, is a common injury, and more frequently met with than any other variety of dislocation. It is caused in most instances by a fall on the elbow, or on the outstretched hand, but may be the result of a severe blow on the outer surface of the shoulder. It might be produced during a fall from aloft through the patient clutching at a yard or at the rigging, in order to arrest or break his descent. Instances have been recorded in which the injury occurred through a fall through an open hatchway, the patient being caught and suspended by the arms.

Signs.—These are usually very characteristic and distinct. They are (*a*) flattening of the shoulder, most marked on the outer surface, where the usual prominent and rounded swelling is replaced by an almost even surface. (*b*) The arm, instead of hanging down in contact with the side of the body, is displaced outwards and slightly backwards at its lower part, so that the elbow is at some distance from the ribs and cannot be applied to

the body without causing much pain. These two signs will be found more evident on stripping the upper part of the chest, and comparing the injured with the opposite shoulder. (c) If the injured arm be slowly and carefully raised, and the armpit be examined, it will be found that this hollow is not so deep or so free as that on the other side, being occupied by a hard rounded swelling formed by the displaced head of the bone. These three

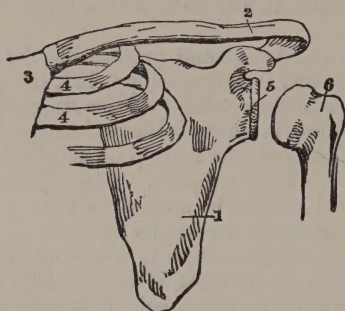


Fig. 40.—Skeleton of Shoulder.

1. Shoulder blade.
2. Collar bone.
3. Breast bone.
4. Upper ribs.
5. Cup of shoulder blade.
6. Arm bone.

signs, though very useful in most instances, may be found obscure if the injured person be very corpulent. In many instances of this injury the patient complains of severe pain in the upper limb, and of a feeling of numbness in the hand. Occasionally the hand of the injured limb is distinctly cooler and darker than the other. There is not, as a rule, so much swelling and bruising in the shoulder and arm as in cases of fracture near the upper end of the arm bone.

Treatment.—If the signs of dislocation of the shoulder be evident, an attempt to replace the arm bone should be

made at once, and before the patient has had time to recover from the shock caused by the injury. The arm should be raised very *gently* and *slowly* until it is at right angles to the side of the body, an effort being made at the same time to divert his attention as much as possible by talking to him or by giving him some fluid stimulant. Whilst the arm is in this position, firm, but not sudden, pressure should be made on the hard swelling in the armpit, which may at once return to its socket with a distinct jerk. If this method fail, which it is likely to do in a muscular and sensitive patient, the person attempting to reduce the dislocation should take off his boot, and, using the right foot for the right, and the left foot for the left shoulder, fix his heel well into the armpit, and grasping the patient's wrist and forearm, drag the whole arm downwards. If this fail a jack towel, or a long and narrow piece of canvas, should be fastened around the arm by a clove hitch, and, the heel being

still retained in the armpit, another attempt be made to stretch the limb by pulling on this instead of on the patient's wrist. If the patient be strong and muscular, a second person may assist in dragging down the arm. It is very necessary, however, that this traction be performed slowly, and with gradual increase of force, care being taken to avoid any undue irritation of the sensitive and overstrained muscles. During this stretching of the injured limb, a third person may be employed in fixing the shoulder, and upper part of the chest on the injured side, by holding firmly a long towel or strip of canvas passed under the armpit, the two ends of which are carried upwards along the same side of the patient's head, or to the opposite side, one end across the back, the other end across the front of the chest. If the displaced bone does not readily slip into its place after the above methods have been tried in succes-

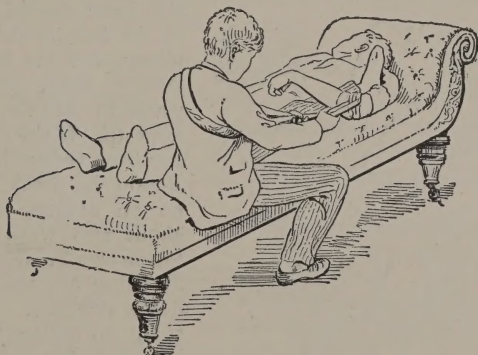


Fig. 41.—Reduction of Shoulder.

sion, it would be better to leave the injured part at rest than to run the risk of doing serious damage by undue violence. There will in almost every case be a good prospect of subsequent reduction by proper surgical treatment within a period of three weeks from the date of injury. Any redness and excoriation of the skin that may have been produced by the pressure of the heel in the armpit, and of the band around the arm, will soon disappear after the application of vaseline or some simple cerate.

Dislocation at the Elbow Joint.—The most frequent form is a displacement backwards of the upper ends of the two bones of the forearm. This accident is met with usually in boys about

14 or 15 years of age, or younger. In adults a severe injury to the elbow is more likely to be a fracture. Dislocation is caused in most instances by a fall on the palm of the hand.

Signs.—The forearm is slightly bent, and fixed in this position. Any attempt to move it backwards or forwards will cause much pain. In front of the elbow there is a hard swelling—the lower end of the arm bone—and behind the joint a very prominent projection can be felt under the skin, which projection is formed by the upper end of the inner bone of the forearm.

Treatment.—If the injured person be far away from professional help, an attempt should *at once* be made to restore the displaced bones to their proper position by grasping the wrist and elongating the forearm, or pulling it downwards in a straight direction, the arm above the elbow being held firm by an assistant.

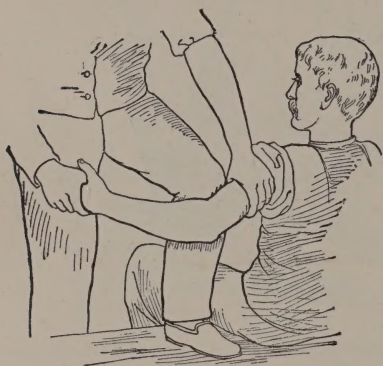


Fig. 42.—Reduction of Elbow.

If this method fail, the knee should be placed on the front of the patient's elbow, and his forearm be slowly bent, whilst the pressure of the knee is kept up. If the dislocation has been reduced, the limb should be bent and kept on an angular splint for about two weeks, cooling lotion (see Prescription No. 3) being applied to keep down swelling. If the attempt to replace the bones has not been successful, the injured limb should be

treated in the same way, and the patient sent on shore at the earliest opportunity, as there is always a good chance of the dislocation being reduced by professional treatment, even after an interval of three or four weeks.

The **Thumb** is sometimes bent and distorted like the letter Z, in consequence of dislocation at the knuckle. A similar injury, but of less frequent occurrence, may occur in the fore and little fingers. The last joint of the thumb also may be dislocated.

Treatment.—These forms of dislocation are very difficult to deal with, and surgeons find in many instances that it is impossible to effect reduction without an operation. As they cause much crippling as well as deformity of the hand, an attempt

should be made in every case to replace the bone by attaching to the thumb or finger stout tape or a narrow bandage tied in a clove hitch, and by pulling with some force on this, the wrist being fixed by an assistant. If this fail, as very probably it will do, another attempt may be made by bending the displaced portion of the thumb or finger backwards.

CHAPTER XXII.

INJURIES OF CHEST AND BACK.

Injuries of the Chest:—BROKEN COLLAR BONE—FRACTURE OF THE BREAST BONE—BROKEN RIBS—WOUNDS OF THE CHEST. Injuries and Affections of the Back:—SPRAINS—LUMBAGO—BROKEN BACK—SWELLINGS ON THE BACK.

INJURIES OF THE CHEST.

Broken Collar Bone.—The usual form of this injury is a fracture near the middle of the collar bone or clavicle. It may be produced at any age, but is far more frequent in infants and young subjects than in adults. The cause in most instances is a fall or blow on the shoulder.

Signs.—The injured person stands with the head inclined towards the shoulder on the side of the injury, and supports the elbow on the same side with the other hand. The shoulder is depressed, and the upper part of the chest on the injured side reduced in width. There is marked deformity at the seat of fracture, the outer end of the inner fragment of the broken bone forming an irregular projection which can be seen and felt under the skin. By pushing the elbow upwards, grating (*crepitus*) may be felt between the ends of the broken bone. In many cases there is severe pain at the seat of fracture.

Treatment.—It is very difficult to keep the fragments in good position, so that they can join together without the production of permanent swelling or deformity. In the case of a seaman, or indeed of any adult male, with whom deformity of the collar bone is of less import than the speedy restoration of the full use of the upper limb, *continuous* rest in bed on the back, and with the shoulders well raised, for one week, and subsequent bandaging of the arm to the side of the chest for the next two or three weeks, would be the simplest treatment when the patient is up. A large and firm pad should be placed in the armpit,

the elbow be pressed well against the ribs by a broad bandage passed round the body, and the limb finally supported and "braced up" by a large arm sling. In bandaging the arm to the body the hand of the confined limb should be placed near the opposite shoulder.

Fracture of the Breast Bone.—This is a rare injury. It is usually caused by the fall of some heavy body on the front of the chest, and is often associated with serious injury to one or more internal organs.

Signs.—There is a well-marked irregularity on the surface of the bone, the lower fragment in most instances projecting forwards and overlapping the upper fragment.

Treatment.—The patient should be kept in bed for two or three weeks. He should at first rest in the half-sitting position, the chest being raised and the head thrown a little backwards. This will relieve any difficulty in breathing. Nothing can be done to keep the two fragments of the bone together in proper position. If the man recover, the irregularity will not be likely to cause any subsequent trouble.

Broken Ribs.—The most frequent cause is a fall on some projecting body. In this way one or two ribs on the same side of the chest may be fractured. In the most severe forms, in which the chest has been violently squeezed, several ribs may be broken on both sides.

Signs.—In ordinary cases there is a sharp "catching" pain at the seat of injury, which is much increased when this part is touched, or when the patient attempts to take a deep breath. There is no irregularity of the broken bone, and it is often very difficult to make out any grating. In consequence of this difficulty, and as fingering of the seat of injury causes much suffering, it would be well in every case of a sharp blow on the chest, followed by difficulty of breathing and a catching pain, to treat the injury as one of broken rib.

Treatment.—The injured man should be kept at rest in his bunk for the first three or four days, and a bandage about six inches broad be firmly applied around the chest, in order to support the fragments of bone and to steady the ribs during the movements of breathing. If a bandage of this breadth be not available, the chest may be tightly wound round by the triangular bandage folded broad, or by a long and broad strip of linen or soft canvas. If the bandage thus applied around the whole chest cause increased difficulty in breathing, and the patient become much distressed and blue in the face, it would be better to confine only the injured side of the chest by applying over

the seat of pain one or two broad strips of sticking plaster. Each strip should be about four inches broad, and reach from the spine to the breast bone.

Blood-spitting, followed by painful cough and expectoration of thick and dark-coloured phlegm, may occur in connection with fracture of one or more ribs. In some cases a soft swelling, which crackles when touched, forms over the seat of injury and spreads over the side of the chest upwards to the neck, the tissues under the skin being blown-up by air (emphysema). Each of these conditions shows that the lung has been wounded by the broken rib. The spitting of blood usually ceases in the course of three or four days, and need not cause much anxiety unless the bleeding be profuse and several ribs be broken. The patient, however, should be kept at rest and on low diet whilst the discharge of blood and the subsequent expectoration of blood-stained phlegm lasts. The swelling caused by air, though sometimes very extensive and alarming, will speedily disappear without causing the patient much trouble.

When several ribs have been broken on one or both sides of the chest, the injury will probably prove a very serious one. Such a result must have been caused by excessive violence, and the lung and its enveloping membrane may have been extensively wounded. In such cases symptoms of internal bleeding will be followed by those of very difficult breathing and suffocation. Very little can be done to assist the patient effectually, or even to give relief. He should be propped up in his bunk and kept at perfect rest. No stimulant should be given, but only some iced water or barley water. The wall of the chest should be left free, and no attempt be made to restrain the breathing by bandage or plaster.

Wounds of the Chest.—A broad distinction exists between wounds on the surface of the chest and those which penetrate into its interior.

Simple *non-penetrating wounds* of the front or back of the chest resemble those in other parts of the body and require similar treatment. If large they are apt to heal slowly, as prompt union of the raw surfaces is hindered by the constant movement of the ribs.

A deep or *penetrating wound*, such as may be caused by stabbing or a gunshot injury, is usually one of very serious import, as the heart, a large blood-vessel, or one of the lungs will probably have been involved.

Though some instances have been recorded in which life was prolonged for days, and even for weeks, after a wound of the

heart, a deeply penetrating injury in the region occupied by this organ usually results in almost immediate death.

Symptoms.—The following symptoms, when observed in a person who has recently been stabbed or shot in the chest, would indicate that the lung is wounded :—Spitting of red and frothy blood ; discharge of similar blood from the wound in the chest ; much prostration ; sharp pain in the injured side of the chest ; difficulty in breathing and troublesome cough. It has been recommended to test the wound by holding a lighted candle opposite to it, and direct the patient to take a deep breath, when, if the candle is blown out, it is a proof that the lung has been wounded.*

There are many sources of danger whilst the injury is still recent. The patient may sink from profuse bleeding, or may be suffocated from compression of the wounded lung by a large accumulation within the chest, either of blood or of air. In the latter case the chest when tapped gives a clear sound like that from an empty cask.

If the injured person survive until the third or fourth day there will be a fair prospect of ultimate recovery, but there are other dangers to encounter. A wound of the lung communicating with the external surface of the chest generally results in inflammation of the injured organ (pneumonia), and often in a collection of purulent matter in the corresponding chest cavity.

Treatment.—If the external wound be small it should be carefully cleansed by a solution of carbolic acid (2 teaspoonfuls to half a pint of water), and closed by lint or cotton wool dipped in Friar's balsam. A broad bandage should then be applied around the chest. The patient must, of course, be kept at absolute rest, either lying on the injured side or propped up in bed. If much prostrated by bleeding he may take some brandy and whisky, but it is better to avoid, if possible, any stimulant for a time, and to administer only milk, barley water, or simple iced water. If there has not been much internal bleeding, and the patient retains his usual colour and is not cold, a mixture containing laudanum and sweet spirits of nitre (Prescription No. IX.) may be given every three or four hours. Should symptoms of pneumonia—high fever, increased pain in the chest, frequent cough and expectoration of blood-stained matter—come on four or five days after the injury, it would be well to administer 5 grains of calomel at once and to follow this by a mixture of ammonia and ether (Prescription No. VI.), and, at the same time, to allow the patient brandy at frequent intervals and a liberal supply of beef tea.

* *The Surgeon's Pocket-Book* (Porter and Godwin), p. 90.

INJURIES AND AFFECTIONS OF THE BACK.

Sprains of the back and neck occur frequently in seamen from over-exertion in lifting or hauling, and from being thrown over at the wheel or by a heavy sea on deck. The injured region is very stiff and there is acute pain at every attempt to bend or turn the body. These symptoms often persist for many weeks, particularly in drinkers and rheumatic subjects.

Treatment.—Rest in bunk and frequent application of flannel either wrung out in “scalding” water or well heated in front of a fire. As the pain passes off and the patient becomes able to sit up and walk, he should have a hot bath. After the more severe symptoms have subsided, the back should be well rubbed night and morning with opodeldoc. The rubbing should be kept up for at least half an hour at a time.

Lumbago or “pain across the loins,” which is usually caused by exposure of the back to a sudden change from heat to cold, may be treated in the same way as a sprain. For the first two or three days an opium pill (5 grains) or Dover’s powder (10 grains) should be given at night, and a full dose of Epsom salts the following morning.

Broken Back.—This serious injury may be caused by a fall from aloft or by diving into shallow water, but on board ship is in most instances the result of a fall into the hold. It is almost always fatal. When the fracture is seated in the neck the patient usually survives but for a few hours; when it is low down in the back he may linger on for many weeks.

Symptoms.—There is much tenderness at the spot where the spine has been broken, and sometimes a projection of bone can be distinctly felt here. The most certain and characteristic symptoms of the injury are loss of feeling and complete loss of power of movement in the limbs below the fracture. For instance, when the back is broken low down and near the loins, the legs are paralysed; when the fracture is in the neck, both arms and legs are similarly affected.

Treatment.—The patient should be carefully removed to his bunk on a *stretcher* and laid on a soft mattress. Attempts should be made to take off pressure from the buttocks, hips, and heels, in order to avoid bed sores, which form very quickly in cases of broken back, and spread widely and deeply. The bed linen under the patient should be kept smooth and clean, and a thick layer of soft oakum be placed near the anal vent and under the privates, and be frequently changed, as the stools are often passed without the patient’s knowledge. As the patient is

often unable to relieve his bladder, the urine should be drawn off by means of a soft catheter at least twice daily. *This should not be neglected.* To relieve pain bromide of potassium, in scruple doses, may be given occasionally. If in the course of the second or third week the belly becomes much distended and there be obstinate constipation, it will be necessary to give strong purgatives (calomel, 5 grains, with jalap powder, 10 grains; purging pill, 15 grains) or to administer an enema of 1 ounce of turpentine to a pint of gruel.

Swellings in the Back are not of very frequent occurrence. Those that are firm and painless and do not grow quickly will probably prove to be tumours, and may be disregarded until the vessel reaches port. A man complaining of a large soft and painful swelling in either loin should be kept at rest, as such swelling would probably be due to an abscess. A hard angular projection in the middle of the back should, if recent and painful, render it necessary for the man to keep quiet or to do only very light work during the rest of the voyage.

CHAPTER XXIII.

INJURIES OF THE ABDOMEN.

Contusions. Injuries of Internal Organs:—RUPTURE OF STOMACH—SPLEEN—KIDNEYS—INTESTINE—INTERNAL BLEEDING—INFLAMMATION—RUPTURE OF THE BLADDER—WOUNDS OF THE ABDOMEN—VARIETIES OF WOUNDS—TREATMENT.

Contusions.—A severe blow on the front of the abdomen—a “hit in the wind”—will cause very intense pain, faintness, and vomiting. If no internal organ has been injured, the patient will speedily recover. He should, however, be placed on his back and kept warm by thick blankets and a hot-water bottle. *No stimulant or fluid of any kind should be given until he has quite recovered from the shock.*

INJURIES OF INTERNAL ORGANS.

In any severe injury to the abdomen from a violent blow, a fall, or a squeeze, there is a probability of one or more of the more important organs of this region having been injured. The danger in such cases is very great, as death may result soon

after the injury from bleeding, or, if the patient rally, may be due to inflammation (peritonitis).

Rupture of the **Stomach** is indicated by intense shock, pain between the navel and the tip of the breast bone, and vomiting of blood.

If the **Liver** has been ruptured there will be pain on the right side under the ribs, and after an interval of two or three days the patient, if he survive, will become jaundiced.

Intense pain on the left side and much collapse and pallor indicate rupture of the **Spleen**. If there be much tenderness in one of the loins and the urine is of a deep red colour or almost black, one of the **Kidneys** has been much bruised or torn.

Rupture of the **Intestine** is followed by more or less shock, frequent vomiting, intense thirst, and a burning pain over the whole abdomen.

Of these injuries rupture of the stomach is the most serious, and rupture of the kidney the least so.

The signs of **Internal Bleeding** after an injury to the abdomen are: increasing prostration, pallor and coldness of the surface of the body, and restlessness.

Inflammation (peritonitis), which comes on after a varying interval—very soon after rupture of the stomach or the intestines, later after rupture of a solid organ like the liver—is marked by extreme tenderness over the belly, more or less swelling, high temperature (102° to 104°), vomiting, first of greenish fluid, afterwards of brown fluid resembling watery stools. The patient lies on his back with both knees drawn up.

As in a wound of the lung, the inspired air may pass out into the tissues under the skin of the chest and form a large crackling swelling (emphysema); so the gas contained in a ruptured intestine may escape into the wall of the abdomen and present a similar condition. This in itself will do no mischief, but it is a serious and alarming symptom, as it shows that the intestine has been wounded.

Treatment.—In cases of rupture of one or more of the important organs of the abdomen very little can be done. Internal bleeding, if not arrested, will in most cases cause death in the course of one or two hours; and inflammation, when once established, is almost inevitably fatal. The patient, when first seen soon after the accident, should be laid in his bunk and be well covered by thick blankets, and be kept warm by hot-water bottles. Nothing should be given by the mouth during the stage of shock. Should the patient recover from this, ice may

be sucked and barley water or cold beef tea may be taken in small quantities—just a teaspoonful—from time to time. If there be much pain, 15 drops of laudanum in a tablespoonful of water should be given every four or five hours. If there be much sickness, a mustard poultice may be applied over the stomach. Should the patient recover from the shock of the injury, and the symptoms of internal bleeding pass away, it would be well to keep him quiet for the rest of the voyage, and during this to allow but little nourishment, and that fluid. At the end of a week, if no bad symptoms have set in, a dose of Epsom salts may be administered. The patient should be kept on his back until he is quite free from pain in every part of the abdomen.

If symptoms of inflammation (high fever, increased tenderness, swelling of abdomen, and vomiting) set in, laudanum in 15-drop doses should be given every four hours, and fomentations be constantly applied to the front of the belly. Very little, unfortunately, can be done in the way of direct treatment, but every effort should be made to relieve suffering, and a shipmate should be told off to attend specially to the patient's needs and to keep him and his surroundings warm and clean.

Symptoms.—The Urinary Bladder, like other important organs of the abdomen, may be ruptured by a fall or blow. There are in connection with this injury certain peculiarities by which it can, in most cases, be distinguished from any of these just described. The bladder at the time of the injury is usually very full. A man who has been drinking freely has a heavy fall whilst under the influence of liquor, or receives a kick in the lower part of the belly in a fight. On coming round he feels a strong desire to make water, which he cannot satisfy, and very probably will complain of a severe burning pain within the abdomen. If a catheter be passed, only a small quantity of dark coloured urine or, perhaps, merely a few drops of pure blood can be withdraw. The bladder has burst and the urine has been discharged either into the loose tissue around this organ, or into the large cavity of the abdomen. In either case acute inflammation will be set up which, unless professional help can be at once obtained, will soon prove fatal.

Treatment.—If such help be not available, all that can be done is to pass a catheter and to tie it in, and to administer opium (either 5 grains of opium pill, a 5-grain tabloid, or 15 drops of laudanum) every four hours. Hot fomentations should be applied over the belly to relieve pain. A like injury marked by similar symptoms may be produced in connection

with a bad crushing injury of the lower part of the body (Fracture of the Pelvis).

Wounds of the Abdomen.—Much more depends on the depth than on the width or length of a wound in this region. In some wounds the skin only or, with this, a portion of the fleshy wall has been divided; in others the cutting instrument has passed deeply and into the cavity which contains the important organs of the abdomen. There are still further varieties; in the latter or *penetrating* wounds, no further mischief may have been done, or some organ, as the stomach, the intestine, or the liver, may have been cut. Through the external wound some portion of the abdominal contents may or may not be protruded; and, again, this protruded structure, usually intestine or fat, may or may not be wounded. The simplest and least dangerous of these injuries is a skin wound in front of the abdomen; the most formidable a deep and penetrating wound through which a portion of gut is protruded, which is itself also opened by a wound. A widely gaping and extensive wound on the surface may be free from danger, whilst a mere puncture if it reach the cavity will in most instances prove inevitably fatal. The sources of danger in penetrating wounds are internal bleeding, shock, and inflammation.

Treatment.—*Wounds* that are evidently *superficial*, and have not divided the whole thickness of the skin and flesh in front of the belly, require the same treatment as wounds elsewhere. After the bleeding has ceased the raw surface and surrounding skin should be cleansed by water that has been recently boiled or distilled; the edges of the wound, if gaping and far apart, be brought together by stitches, and a dressing be applied of lint or cotton wool saturated with Friar's balsam and, over this, of dry cotton wool and a bandage.

If, although there be *no protrusion of any of its contents*, there may be good reason to believe that *the belly has been opened*, the wound should be closed and treated like a superficial one *provided* the patient be at ease and free from any of the symptoms that would indicate injury to the intestine or other important organ. If, however, there be much pain with vomiting and prostration, or if there be pallor, restlessness, and other signs of internal bleeding, the wound, if small, should be simply covered by dry cotton wool or gauze, and, if large and gaping, be only partly closed by stitches, an opening about two inches in length being left unstitched to allow the escape of any fluid that might collect in the cavity of the abdomen.

If a *knuckle of gut protrude through the wound* this, if not cut

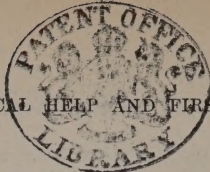
or damaged, should be very carefully cleansed by a pad of clean cotton wool dipped in *warm* water that has been very recently boiled or distilled. It should then be put back either by squeezing it gently between the thumb and fore-finger, or by pressing on it lightly with a soft pad of lint "wrung out" after immersion in hot water. If the wound be one of some hours' duration and the protruded gut be very red and inflamed, or if it be of a maroon or dark purple colour, as if about to mortify, it should not be interfered with but be allowed to remain. If the patient survive, the coats of the gut will give way sooner or later, and an unnatural vent for the stools be formed, which will need the frequent application of large and thick pads of soft oakum.

If a *loose mass of soft fat* (caul or omentum) *protrude* through the external wound, this, if small and clean, should be first bathed with warm distilled water and be then put back, the wound being afterwards closed by stitches and covered by lint or cotton wool dipped in Friar's balsam. If the protruded caul be very large, or dirty or damaged, the neck of it at the level of the wound should be carefully and securely tied with stout thread, and the free portion be cut away close to the thread by scissors. In fixing the thread care should be taken to see that there is no protrusion of gut, as well as of omental fat. *If there be any doubt as to this*, it would be well not to interfere with the protrusion beyond dusting it with iodoform and protecting it by lint dipped in a weak solution of carbolic acid (2 teaspoonfuls to $\frac{1}{2}$ pint of water). *If a piece of gut protruding* through an external wound be itself *wounded*, it should be allowed to remain, and be covered by cotton wool or some other light dressing. If there be much gut protruded, and the wound in the skin be large, all except the wounded portion of gut should be gently put back, and most of the wound be closed by stitches. Great care, however, must be taken that the wounded portion of gut does not slip back. If professional aid be not available for some days after the injury, an unnatural vent will form, as after mortification of protruded gut, should the patient recover.

In penetrating wounds of the abdomen, still more than in rupture of the internal organs without external wound, inflammation (peritonitis) is almost invariably the main source of danger. When once excited it takes a rapid and raging course, and speedily places the injured person in a very serious position. As stated above, all that can be done in such cases in the absence of a medical man is to relieve pain, and to comfort the patient as far as possible by constant nursing and prompt attention to his wants.

The following extract from a medical journal* will show how much good can be done in very serious injury of the abdomen on board ship, by intelligence and careful attention on the part of the captain:—"On August 28, 1876, a Swedish seaman, aged thirty-four, on a passage from Sydney to London, whilst painting the mizzenmast, slipped and fell from the board on which he was suspended. He clasped the mast with both arms and glided rapidly downwards towards the deck, but in his fall came across some belaying pins, which penetrated his abdominal wall and produced a large transverse gaping wound. According to the reports of the ship's captain and of the patient himself, a large mass of naked intestine protruded through this wound, and extended for some distance beyond its edges. The patient having been lifted from the belaying pins and laid on deck, the captain replaced the coils of intestines, brought together the edges of the wound by sutures of thick black thread, covered the front of the abdomen with thick layers of dry lint and flannel, and finally compressed the body with a broad sheet. The injured man was not removed to the forecastle, but was kept on deck close to the scene of the accident. He was placed on a soft bed, and protected by a small tent made up of an old sail and some light spars. He was fed on milk, sago, beef tea, and sopped bread; occasionally a small quantity of brandy was administered. The patient remained under these conditions until the afternoon of September 10, when, just as his ship reached the entrance to the West India Docks, he was carefully placed in a boat and taken to a hospital. The captain reported that no bad symptoms had been observed at any time after the accident. There had been no sickness, and no complaint of pain in the abdomen. The man had not been feverish and had not lost his appetite; he had complained frequently of the insufficiency and the light quantity of his diet." This patient, who was really convalescent when removed from his ship, soon made a complete recovery.

* *Medical Times and Gazette*, December 30, 1876.



CHAPTER XXIV.

INJURIES AND DISEASES OF THE LOWER EXTREMITY.

Injuries at or near the Hip:—DISLOCATION OF THE HIP—BROKEN THIGH — BROKEN KNEE-CAP — BROKEN LEG — COMPOUND FRACTURES OF THE THIGH AND LEG — DISLOCATIONS OF THE KNEE AND ANKLE. Wounds of the Lower Limbs:—BLOOD-VESSELS OF THE THIGH, LEG, AND FOOT—WOUNDS IN THE THIGH—KNEE-JOINT—ANKLE-JOINT. Fractures of the Pelvis:—CONTUSIONS AND SPRAINS. Swollen (Varicose) Veins:—INFLAMED VEINS — ULCERS OF THE LEGS—BLISTERS ON THE FEET—CHILBLAINS—GUINEA WORM.

THE arrangement of bones in the lower is very similar to that in the upper extremity. There is one long bone (*femur*) in the thigh, and two bones in the leg—the strong and thick shin bone (*tibia*) on the inside, and the slight and thin brooch bone (*fibula*) on the outside. The back part of the foot and the instep contain seven uneven bones (*tarsal*), the largest of which, projecting backwards to form the heel, is called the heel bone or *os calcis*. In front of these are: one row of thin and long bones covered by the flesh of the foot (*metatarsal*); two rows of thin but shorter bones (*phalanges*) in the great toe; and three rows of similar bones in each of the other toes. In front of the knee there is a loose flat bone, the knee-cap (*patella*).

Injuries at or near the Hip.—Injuries are frequent in this part of the body, and the nature of the injury varies much in different instances. Even an experienced surgeon may find it difficult to make out precisely the nature of the mischief. The hip is surrounded by thick muscles, and so the injured part cannot be readily felt; and when a fracture has occurred near this joint, grating or crepitus, on which much reliance is placed as a sign of broken bone, may be very indistinct or quite absent. Notwithstanding these difficulties, careful attention to certain simple points will enable one, in the absence of professional aid, to form a more or less accurate opinion as to the nature and severity of the injury, and to avert any bad results from total neglect of treatment. In the case of a man lying on his back helpless and disabled in consequence of an injury to the hip caused by a blow or fall, attention should be directed to the following points:—

1. *How far the patient can move the injured limb.*

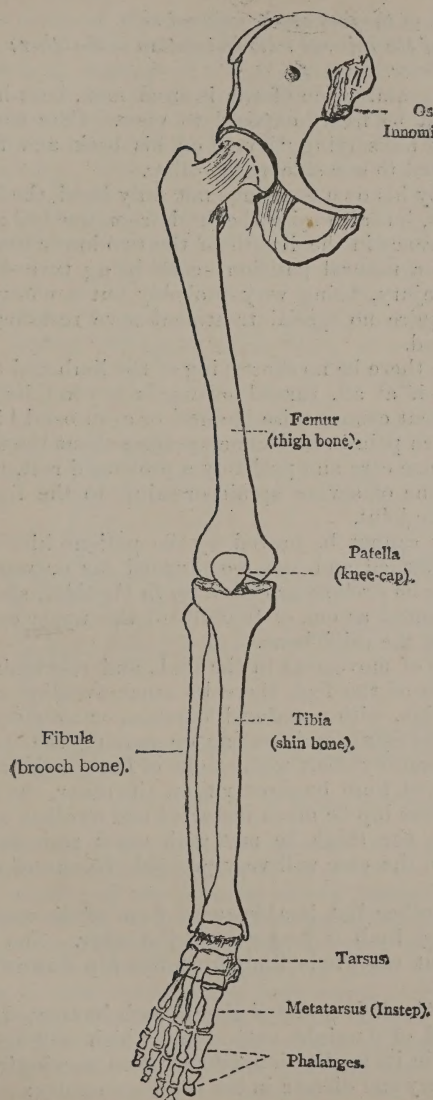


Fig. 43.—Skeleton of Lower Limb.

2. *The position of the foot on the injured side.*
3. *The length of the injured limb in relation to the other: whether it be longer or shorter.*

In making an examination of the injured man, both hips and lower limbs must be freely exposed to view. Care should be taken to see that he is lying "level" on his back, and that his body is not twisted to one side or the other.

a. If he can by his own exertions not only bend the knee of the injured limb, but also raise the heel from the bed; and if there be no difference in the length of the two lower limbs, and both feet are in a natural position—each being turned a little outwards—the injury, being very probably but a contusion of the hip, will require no special treatment save rest for two or three weeks in bed.

b. If, although there be no shortening of the limb and the foot be but slightly, if at all, turned outwards beyond its proper position, the patient cannot raise the heel or even bend his knee, and there be much pain in and some swelling about the hip, the man will need some care and probably a prolonged rest, the case being probably one of severe sprain or injury to the ligaments and muscles of the joint.

c. If the limb cannot be moved by the patient himself, and the limb be shortened and the foot turned far outwards, the injury, *if there be no swelling or deformity in the thigh*, should be regarded and treated as one of fracture of the upper end—the so-called neck—of the thigh-bone.

d. If with loss of movement in the limb, and shortening, and turning outwards of the foot, there be much swelling and deformity of the thigh, with unnatural looseness or mobility of the limb below the swelling, and grating on moving the limb, the case should be carefully dealt with as one of broken thigh bone.

e. If the injured limb be shorter than the other, the foot be turned *inwards*, the hip be much distorted and swollen, and any attempt to move the thigh be met with much resistance and cause much pain, the case will very probably be one of dislocation at the hip.

f. There is another but less frequent form of dislocation, in which the injured limb is longer than the other. The foot is fairly straight, but the whole limb from the hip downwards is turned outwards.

Treatment.—Cases *b*, *c*, and *d* should each be treated by the following method of "weight extension," which will be found easy and simple in its application, and of good service in many cases both of injury and disease in the lower extremity:—A strip

of stout sticking plaster, $2\frac{1}{2}$ inches broad and about 4 feet in length, should first be cut, and on the outside of this should be laid a strip of bandage of the same breadth and length, so as to form a double layer; on the middle of this double layer, and applied to the sticking or plaster side, should be fixed by tapes a thin piece of wood of the same breadth as the plaster and about 4 inches long. This piece of wood should be perforated by two holes, through which a short piece of stout cord can be passed. One end of the long strip of plaster and bandage should be fixed by the sticking surface to the outside of the knee or thigh, and the other end to the inside, and the intermediate portion down to the ankle should be pressed to the skin of the leg and made to stick there by narrow strips of plaster applied lightly, but evenly, around the limb; these being afterwards covered and kept in close contact with the skin by a bandage carried from the ankle to the lower part of the thigh. The ends of the long strip may be turned back with the sticky surface of each outwards, and be covered by extra short strips of plaster and the last turns of the bandage. This gives greater security against slipping. The perforated piece of wood must correspond to the

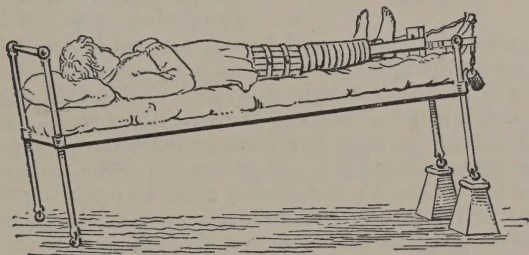


Fig. 44.—Extension of Thigh by Weights.

sole of the foot, there being an interval between the two of at least 3 inches, and care should be taken to see that it is broad enough to take off the pressure of the plaster from the sides of the ankle. After an interval of three or four hours to allow the plaster to stick lightly to the skin, the cord passed through the two holes in the foot-board should be fixed to a weight, or bag of shot, or some other heavy body slung over the end of the mattress. If it be practicable, the cord should be passed over a small fixed pulley. In the case of a strong and muscular adult the weight should be 10 lbs. at first, and after the first twenty-four hours be gradually increased to 15 lbs. By this appliance

the thigh is gradually stretched and lengthened, and the ends of the fragments of broken bone are brought together and kept at rest. It will be found useful in a great variety of cases, as, for

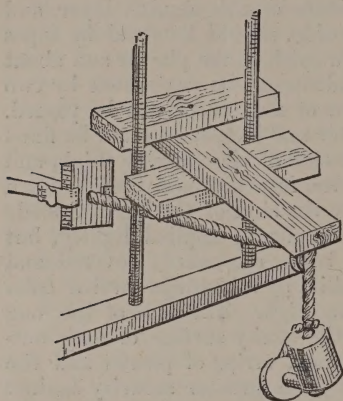


Fig. 45.—Extension of Thigh by Weights.

instance, in injuries of the hip and in hip-joint disease, in fracture of the thigh bone, and in wound, contusion, and painful swelling of the knee.

In applying weight-extension there are certain points to be attended to. If the patient's limbs be "hairy," the skin of the leg should be shaved before the plaster is applied. If the foot and toes swell and become blue and cold after the leg has been bound, the weight should not be fixed until this condition has passed off; and if the swelling and coldness should increase and become disquieting, it would be well

to remove all the plaster and bandaging, and to apply it again less tightly on the following day. If the plaster should cut into the skin and produce a sore in front of or behind the ankle, the tight edge should be nicked and the extending weight reduced. The heel should be kept free from pressure by placing a small pillow or some soft support under the leg. The patient's head should be lower than his feet, and if there be a tendency for the weight to pull him down in bed, a long sling—a jack towel, for instance—may be passed under his fork and be fixed behind his head. During the treatment by "weight-extension" the patient should be kept on a firm mattress.

The many difficulties on board ship in using this appliance—such as may arise from bad weather, want of space, &c.—will be less rather than greater than those in the way of other plans of treatment. Weight-extension may be recommended as the simplest and the least uncomfortable method of dealing with fracture near the hip or in the thigh.

If the foot be turned far outwards, and can be easily placed in its proper position, it may be kept there either by a sandbag applied to the outer surface of the leg and foot, or by a long narrow splint reaching from the hip to the foot. A long sandbag will in most cases suffice to keep the foot straight. If there

be any difficulty in replacing the foot, especially in a man over fifty years of age, no attempt should be made to replace by force.

Should the treatment by "weight-extension" be found impracticable or very inconvenient, a well padded splint about 4 inches in breadth, and long enough to extend from the armpit to a few inches beyond the sole of the foot, should be applied by plaster and bandages or handkerchiefs to the leg and lower part of the thigh. The lower limb should then be gently pulled down and the upper end of the splint, which ought to be near the armpit, held in place by a long sling, formed by a soft handkerchief or piece of sheeting carried under the fork (perineum), and passed through two holes near the upper end of the splint, where it is

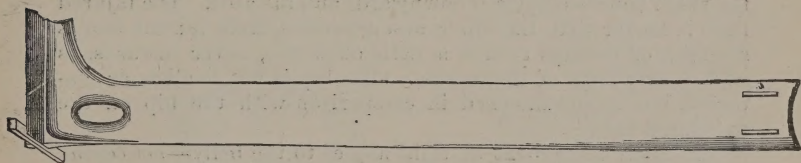


Fig. 46.—Thigh Splint.

firmly tied. The upper half of the splint should be applied to the side of the chest by a broad bandage, a broad strip of soft canvas, or a long towel.

Dislocation of the Hip.—The most frequent form is that in which the upper end of the thigh bone is displaced upwards and backwards.

Signs.—The lower limb is shortened, bent at the knee and hip, and twisted *inwards*, so that the great toe on the injured side rests on the front of the foot or ankle of the sound limb. There is much swelling and distortion on the outer side of the hip.

Treatment.—If there be no prospect of obtaining professional treatment in the course of the first fortnight after the accident, an attempt may be made to reduce the dislocation. Such attempt should be made at once, and whilst the man is still more or less enfeebled by the shock of his injury. As the necessary movements for replacing the dislocated bone (which are usually made in surgical practice with the aid of chloroform or ether) are likely to cause much pain, and to be forcibly resisted, the injured man should be strongly urged to exercise patience and self-control, and to co-operate as far as possible in the efforts

to avert a serious and disabling deformity. The captain, supposing the injury to be on the right side, grasps the patient's ankle with his right hand and the knee with his left. He then gently bends the thigh on the belly, and keeping it bent, turns it outwards towards the bed. The thigh is next twisted outwards in its long axis by carrying the foot of the injured side over the other leg, and at last the whole limb is brought down and straightened by the side of the other. The different movements may be thus briefly stated: *lift up, bend out, roll out*. This should be done by the captain's hands alone, and no extra force should be applied either by the weight of his body or by the action of an assistant.

In a second and less frequent form of dislocation, the head of the thigh bone is displaced downwards and inwards. The injured limb is longer than the other, and separated from it; the foot is straight, or perhaps turned a little outwards, never inwards, as in the first form of dislocation. The hip is not swollen or distorted, but much flattened in comparison with the hip on the uninjured side.

The thigh being bent at right angles to the belly—not beyond *this position*—the movements must be made in reverse directions to those made in the former dislocation. As the thigh is being bent up towards the belly it should be turned a little outwards, but afterwards be turned well inwards over the opposite thigh, and at the same time the thigh bone should be twisted or rolled inwards. The injured limb should then be brought down to the side of the other. The movements here are: *lift up and at same time bend a little out, bend in, roll in*. If, after apparent reduction of this dislocation, the limb should remain distorted, but with the leg shortened and the foot turned in, the movements described in the former injury should be carried out. In such case, instead of the thigh bone having been replaced in its socket, one form of dislocation has been substituted for the other.

If the dislocation has been set right, the injured limb should be bound to the other by a bandage or a narrow strip of canvas applied just above the knee, and the patient be kept at rest for about three weeks. If the attempt to replace the bone has failed, nothing more can be done save to keep the patient on his back until the vessel reaches port, when professional aid should be promptly obtained. There is a fair chance of reducing an old dislocation of the hip-joint within the first month after the injury.

Broken Thigh.—**Signs.**—This not unfrequent injury is usually the result of a fall of some heavy object on the thigh. The

fracture occurs in most instances about the middle of the bone. The injured limb is shorter than the other, the foot is turned outwards, and the leg and knee are rolled over on to their outer surfaces. The thigh is much swollen and distorted, and very loose, so that the lower part can be moved independently of the part above the fracture. On grasping the thigh and moving it slightly, grating (crepitus) may be distinctly heard and felt. The patient is quite helpless, and cannot stir without suffering pain in the injured limb.

First Aid Management.—Before the patient is carried from the place of injury to his bunk or to the nearest hospital on

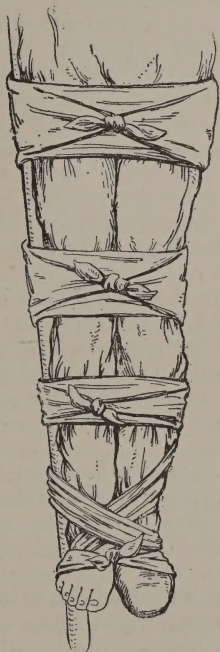


Fig. 47.

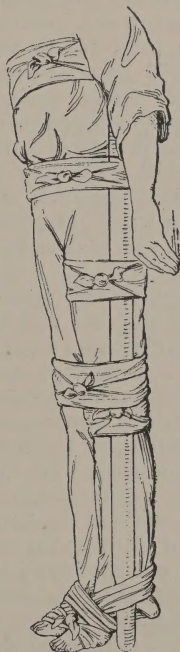


Fig. 48.

Improvised Thigh Splints.

shore, the following steps should be taken to ensure a safe and comfortable transit and to prevent a wound of the skin or of some large blood-vessel :—The boot should be removed, but not the leg of the trousers, which should be simply slit up, so that

if there be any large and bleeding wound this may be cleaned and covered at once by lint or a clean handkerchief. The injured limb should be gently stretched and pulled down, the foot and leg being turned inwards, and be then fixed by handkerchiefs or long strips of linen to a light spar, a short oar or other firm support which, reaching from the armpit to the foot, might be a substitute for the rifle used on the field in military practice. The thigh and extemporised splint may then be partially enclosed in a thick coat or a piece of canvas folded so as to form a firm support, which should be secured by straps or pieces of cord. The injured limb should finally be fixed to the sound one. The patient can now be carried on a stretcher.

Treatment.—A broken thigh may be treated either by weight extension (Fig. 44) or the long splint (Fig. 46). The former method will in most cases be found very effectual, and more comfortable for the patient than the latter. The patient, however, must be allowed more than the usual amount of space, and in bad weather the captain will find it necessary to exercise his ingenuity in contriving some kind of swing bed. After the injured limb has been straightened by the gradual extending action of a weight of about 10 lbs., four short splints should be applied to the broken thigh, and be fixed by handkerchiefs or strips of canvas.

In applying the long outside splint the limb should be pulled down and the foot and leg replaced in their proper position. The leg having been fixed to the splint by plaster and bandages, the limb must be kept straight by a long sling passed under the fork (perineum) and secured to the upper end of the splint (see p. 199). It will be necessary to change this frequently, especially in hot weather, on account of soiling.

The time needed for the firm joining of a broken thigh bone will be not less than eight weeks; at the end of this time, if the thigh be solid and the fragments of bone have evidently united, a plaster of Paris splint may be applied and the patient allowed to move about cautiously on crutches.

Broken Knee-Cap.—This is an awkward injury, as it is likely to disable a man for at least six months, and often results in permanent weakness of the injured limb. It is usually caused by a fall consequent on making a false step.

Signs.—The knee, in most instances, is much swollen and bruised. Before the swelling has occurred or after it has subsided, the two fragments into which the bone is commonly broken may be felt quite loose and separated by a wide gap extending from side to side. There is no shortening of the leg

and the foot is not turned far either outwards or inwards. The two loose fragments of bone seldom come together again, and the main object in the ordinary treatment by splint and bandaging is to reduce as far as possible the width of the gap between them.

First Aid Management.—Place a padded board or splint to the back of the leg and thigh, and fix this with handkerchiefs or strips of bandage or canvas. Before placing the man on a stretcher the two legs should be bound together.

Treatment.—The injured limb should be put on a back splint with a foot piece, or, failing this, may be extended by a weight of 8 or 10 pounds. If the latter method be used the long strip of plaster should not be carried upwards beyond the leg. To reduce the swelling of the knee ice or cold water should be applied. The patient should be kept on his back for two months.

Broken Leg.—This injury may be due to a blow, a fall, the passing of a heavy weight over the limb, or to slipping on a smooth or wet surface. One or both bones may be broken. The fracture may occur at any part, but the most frequent situations are about half-way between the ankle and the middle of the leg, and just above the ankle.

Signs.—When both bones are broken there is usually shortening and distortion of the leg, looseness or free movement at the seat of the fracture, and distinct grating or crepitus. When only one bone is broken there is often some difficulty in making out whether there be a fracture or not, as the sound bone acts as a splint to the broken bone, and so prevents shortening and displacement. In all cases in which the patient cannot use or move the injured leg, and in which the limb is much bruised and swollen, and very tender at one spot, the injury should be treated as a fracture. The most difficult cases to deal with are those of fractures near the ankle, which usually cause much deformity and twisting of the foot.

First Aid Management.—The injured limb should be protected by a broad piece of canvas, be rolled up on each side of the leg (see Figs. 49 and 52), and then fixed around it by

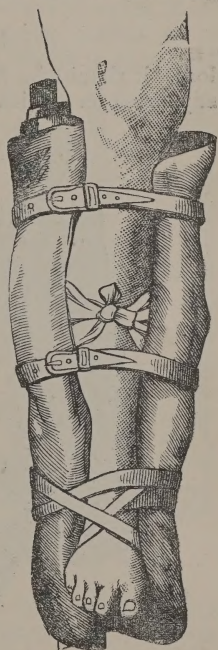


Fig. 49.
Improvised Splints.

straps, the injured man's braces, or thick cords. In the centre of one, or of each roll, a narrow board or thick stick may be inserted (see Fig. 49). If the leg be badly broken and very

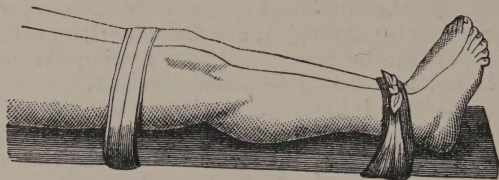


Fig. 50.—Improved Splints.

loose, it should be fastened to the other leg, and both limbs be supported on a thick cushion or a board (see Figs. 50 and 51).



Fig. 51.—Improved Splints.

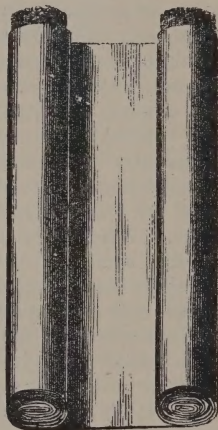


Fig. 52.—Improved Splints.

In setting a broken leg the following points should be attended to:—

The foot to be kept at right angles to the leg and not be allowed to fall.

The great toe to be kept in a line with the inside edge of the knee-cap.

The sides of the ankle and the back of the heel to be kept free, as far as possible, from the pressure of the splints.

No bandage to be applied around the leg under the splints.

If there be much swelling and bruising, the front of the leg, at the part where it is broken, to be left uncovered by splint and bandage for two weeks at least after the injury.

The knee to be kept slightly bent, either by resting the injured leg on a long pillow, or by swinging it.

Treatment.—The simplest way of treating a broken leg is to apply two wooden splints—one on each side. Each splint should be long enough to reach from the knee to the sole of the foot, measure about six inches in width and about a quarter of an inch in thickness, and be made with an angular portion to fit the side of the foot (see Fig. 53). Where the foot piece and straight portions of the splint join a round hole should be made, so that there may be very little, if any, pressure on the prominent sides of the ankle. Each splint should be well padded on the surfaces which are applied to the limb.

If only one bone be broken, and there be very little swelling and no deformity of the leg, nor twisting of the foot, the two sides should be applied and kept on by triangular bandages for about two weeks. At the end of this period a long clean stocking should be put on the leg as high as, or beyond, the knee, and over this a plaster of Paris bandage. At the end of the next three or four days the man, if there be no pain in the leg, may be allowed to get up.

If both bones be broken, and there is decided deformity, the leg should be straightened, and the side splints fixed firmly by strips of plaster and bandages, the broken part being left uncovered in front. In order to prevent the splints from getting loose, two triangular bandages (Chapter xxxi.) should be tied firmly around the limb—one just below the knee, the other between the fracture and the ankle. The leg thus set in splints may now be further protected by outside padding formed by a piece of canvas rolled up on either side (see Fig. 52). This should be bound round the leg by straps or narrow pieces of canvas, but care must be taken that none of these bands press tightly on the skin in front of the leg.

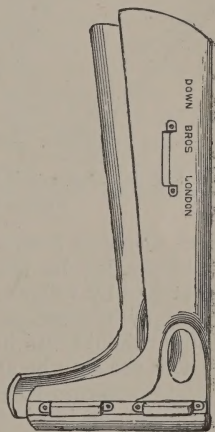


Fig. 53.
Splints for Leg.

When the leg is broken near the ankle there is often much difficulty in removing the deformity, and in getting the foot straight. Two side splints should be applied, as in fracture higher up, and the limb be either kept straight or be bent at the knee, and laid on a pillow or cushion on its outer surface (see Fig. 54). The latter position should be first tried if there be sufficient space in the bunk.

In cases of broken leg much comfort would be afforded the patient by the exercise of a little ingenuity in contriving a

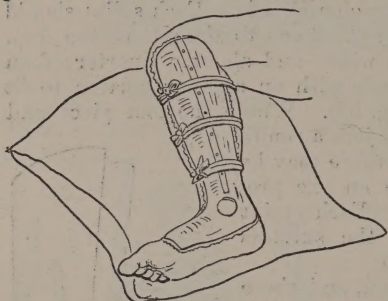


Fig. 54.—Fractured Leg in Lateral Position.

swinging cradle, by which the injured limb could be suspended at a short distance above the bed. A wooden box with the two ends knocked away would answer this purpose if well padded with oakum, tow, or clean straw; or better still, three or four pieces of canvas, each about a foot or more in length, stitched at either end to a round stick. The swing may be suspended either from the

deck above or from a wooden framework placed on the bed.

If the leg be broken just below the knee, the leg may be stretched by weight-extension (see p. 197), care being taken not to apply the straps of plaster above the fracture. Two side splints should also be applied. The patient should be kept at rest, if the ship be at sea, for at least six weeks.

In Compound Fractures of the Thigh and Leg—that is to say, fractures in which the skin and flesh are laid open by a wound—the wound, as it has to be cleansed and dressed from time to time, should not be concealed by a splint. If the thigh be broken and wounded, a weight-extension apparatus (see p. 197) should be applied; and in the case of a similar injury below the knee, in which the wound is on one side, a single splint should be applied to the unwounded surface, the limb being kept steady by sandbags. The wound should be carefully dressed and kept very clean (see *Treatment of Wounds*, p. 117). In very severe cases, in which the wound is large and exposes to view torn flesh and sinews and fragments of bone, all that can be done in the way of setting the limb is to straighten it and to keep it at rest between long sandbags.

Dislocations of the Knee.—The knee being a strong joint is rarely dislocated. There are, however, several forms of this injury. The leg may be displaced either inwards or outwards, backwards or forwards. Each of these injuries may be recognised without much difficulty.

Treatment.—In displacement of the leg to one side or the other, the deformity may in most instances be readily overcome by raising the thigh and then pulling on the leg and at the same time twisting it. If the bones of the leg be displaced forwards or backwards it will be found more difficult to replace them, but, in the absence of professional aid, an attempt should be made, as the injury would certainly result in serious crippling, and might cause mortification of the limb. The leg being grasped near the ankle and steadily pulled down by an assistant, the projecting and displaced bone may be pushed or pulled into its proper position. In this and in other forms of dislocated knee a straight splint, well padded, should be bandaged to the back of the thigh and leg, and an ice bag or cold water be applied to the injured joint. The splint should be kept on for at least two weeks.

Dislocation of the Ankle occurs usually with fracture of one or both bones of the leg near this joint. The leg may be twisted inwards or outwards. The foot should be straightened as far as possible, and afterwards be kept in good position by two side splints, as in the treatment of broken leg.

One of the bones of the foot may be displaced from its connection with the bones of the leg and be thrown forwards on the instep, the foot being shortened. In a case of this kind an attempt should be made to replace it by bending the knee, pulling on the foot, and pushing back the displaced bone. This injury, however, is usually a difficult one to treat and the efforts to replace the bone will probably fail. If, as sometimes happens, the skin be wounded, no attempt should be made to put back the bone. The ankle should be fixed between two splints and weak carbolic lotion applied frequently to the wound.

WOUNDS OF THE LOWER LIMBS.

Blood-Vessels of the Thigh, Leg, and Foot.—A straight line drawn from the middle of the groin to the inside of the knee will correspond in most of its extent to the course taken by the two main vessels of the thigh (femoral artery and vein). These give off large branches to the front and inner portion of the thigh in its upper half. The deep parts of the buttock contain several large vessels, but the back of the thigh between

this region and the upper part of the back of the knee contains no very important branches. The large artery of the thigh as it approaches the inner side of the knee turns to the back of the limb and runs down behind the knee to the upper part of calf of the leg. Here it divides into two large branches, one for the front, the other for the back of the leg. The latter soon divides into two branches one of which runs behind the shin bone, the other behind the splint bone. These three vessels in the leg are well protected by thick layers of flesh, except just behind the inner ankle, where the inner of the two arteries which run along the back of the leg comes very close to the skin. The vessels of the leg unite and form arches in the foot. Those in the sole are well covered, but there is one vessel of some importance which runs close under the skin along the instep in a line corresponding to the gap between the great and second toes. The dangerous regions with regard to bleeding in the lower limb are the buttock, the inside and front of thigh, the back of the knee, just behind the inner ankle, and the inner part of the instep (see Illustration II).

A deep wound in the back of the thigh might injure, or indeed completely divide, the large nerve (sciatic) which runs from the buttock to the back of the knee, causing much pain in the leg and either cramps or numbness of the skin and inability to move the foot.

The most serious wounds in the lower limb, apart from those in which a large blood-vessel is injured, are those of the knee and ankle.

The **Knee Joint** may be readily wounded on either side or in front, as the bag of the joint comes near to the skin at these parts and extends for some distance (three or four inches) above the upper edge of the knee-cap. When this joint has been opened, even though it may be by a mere puncture, it swells rapidly and becomes very painful. If the wound be a large one, there will probably be a discharge of a small quantity of oily and sticky fluid.

Treatment.—The surface of the wound should be thoroughly cleansed with a solution of carbolic acid (one teaspoonful of acid to a tumbler full of water) and be covered by lint or cotton wool dipped in Friar's balsam. The limb should be extended by weights (see p. 197)—the strips of plaster not extending beyond the upper part of the leg—and ice should be constantly applied to the front of the injured and swollen joint.

If the vessel be in port, the leg and thigh should be placed on a well-padded splint and be carefully fixed by pillows or thick

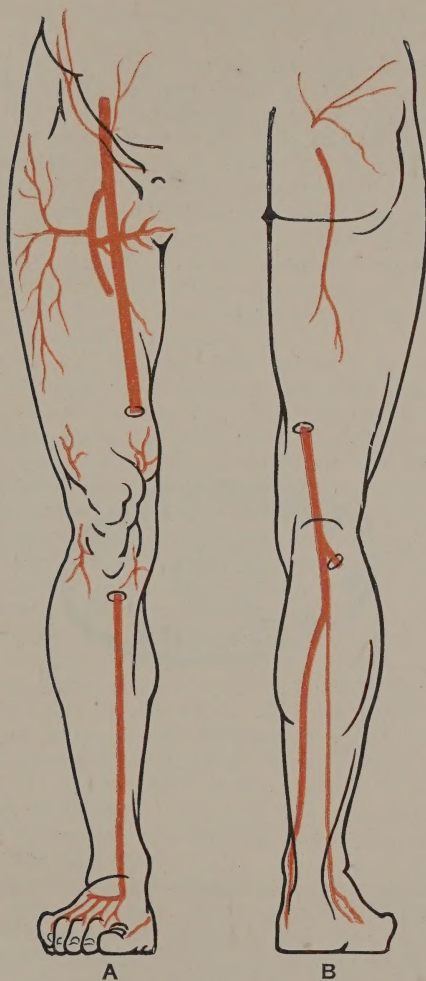


PLATE II.—Arteries of Lower Limb.
 A, Front View. B, Back View.



rolls of canvas before the patient is removed on a stretcher to a hospital.

The **Ankle Joint** being better protected is not so frequently wounded as the knee. Should, however, a deep wound in front of or behind this joint be followed by much pain and swelling and inability to move the foot, the limb should be kept at rest either between two side-splints of wood (see Fig. 55) or between sandbags. The wound should be cleansed and dressed as in the case of a like injury to the knee, and the instep be covered by ice or constantly moistened by spirit lotion (see Prescription No. 3). If the wound heal quickly and the swelling subside, the foot and ankle should, after an interval of two weeks, be enclosed in a plaster of Paris bandage and the patient be allowed to move about on crutches.

Fractures of the Pelvis.—The pelvis is the large basin-shaped mass of bones placed between the lower end of the spine and the thigh bones (see Fig. 5). The brim of this basin—the bony edge which can be distinctly felt below the flank—is sometimes broken away on one side as the result of a fall. In cases of this injury there is generally much bruising, distinct grating, and local tenderness. It is not in itself a serious injury, and requires very little treatment beyond rest in bed for three or four weeks. The most severe forms of fracture of the pelvis are those in which this large mass of bone is broken through at several places in consequence of violent crushing, as when a man is squeezed between a swinging boat and the bulwark, or between a vessel and the side of a dock. The lower limbs at once fail to support the body, and there is much pain between the hips and over the lower part of the belly. The danger of this injury consists not so much in the fracture of the bones as in the probability of the bladder and of the lower part of the intestine being torn at the same time. If the bladder be wounded, the symptoms will be those of rupture of this organ (see p. 190); if the lower gut or rectum also share in the injury, there will be bleeding from the anal vent.

Treatment.—The patient should be moved very carefully and placed on a firm mattress. As there will probably be much shock, some brandy should be given, and the trunk and lower extremities should be kept warm by hot-water bottles and thick blankets. A soft catheter should be passed into the bladder. If the urine come away freely and be quite clear, there will very probably be no necessity for further use of this instrument, but if only a small quantity of blood-stained urine or a few drops of unmixed blood be discharged, it should be allowed to remain

and be tied in. The subsequent treatment should consist in keeping the patient at absolute rest on his back, with his knees bent and raised on pillows. The fragments of bone may be kept at rest and in fair position by binding closely a folded sheet around the pelvis, or, better still, by clothing the lower part of the body and the hips in a pair of thick and closely-fitting drawers. An appliance of this kind can be readily adapted to the required purpose by lacing it up in front or over the hips. The patient should be kept on his back for five or six weeks. Even under the most favourable circumstance he will be disabled for at least twelve weeks.

Contusions and Sprains.—A sharp blow on the knee or ankle may be followed by swelling, bruising of the skin, and inability to walk or to use the injured limb. In sprains similar results may occur, the twisted or overstretched joint being very tender, and much larger than that on the opposite side.

Treatment.—These injuries should never be neglected or treated carelessly. If the joint be swollen a bone may be broken, or some important sinew may be divided, and even a mild sprain or contusion of the knee or ankle, if not treated at first by rest and proper application, may result in prolonged weakness and crippling. In these, as in many other apparently slight injuries, regard to the value of the injured man's services as one of the crew, as well as to his personal interest and comfort, should induce the captain to place him for a time on the sick list. If there be much swelling of the injured joint, the man should be kept in his bunk and the limb be raised on pillows or some other soft support. Whilst the joint is swollen and painful, ice, or lint frequently dipped in cold water, should be applied, and after the swelling has subsided and the patient can bear pressure, a plaster of Paris bandage should be wound lightly round the joint over a flannel bandage or a layer of cotton wool. On the removal of this after a period of two or three weeks, the joint should be rubbed every night with sweet oil, and on the following morning be "played on" with cold salt water from the hose, or from a large can.

The thick sinew (*tendo Achillis*), which runs behind the ankle to the back of the heel, is sometimes snapped across in a sudden movement of the foot. A sharp pain is felt at the moment of the injury, and a wide gap may be felt under the skin at the place where the sinew has been torn through. As this is a disabling injury, the patient should be kept at rest for two or three weeks, the leg being bent at the knee and laid on its outer side. In order to raise the heel and so to keep the ends of the

divided sinew together, a piece of cord attached to the heel of a slipper constantly worn by the patient, should be attached to a broad strap or piece of thick canvas placed round the lower part of the thigh.

Swollen (Varicose) Veins.—This is a common and well-known affection. It consists usually of swelling of one large vein (*saphena*), which runs just under the skin along the inside of the thigh and leg. This vein is not uniformly enlarged, but presents here and there soft and twisted swellings of a bluish tint. These swellings enlarge, and become very prominent after standing and exercise, and subside and almost quite disappear when the man lies down. This condition often causes much discomfort, the patient suffering from “heaviness” in the affected limb and a dull aching pain, which get worse after prolonged exertion. Swollen veins are apt to become inflamed, and often give rise to chronic ulcer of the leg.

Treatment.—As the coats of the swollen veins are permanently damaged by disease, all that simple treatment can effect is to support the weak vessels, and to prevent the blood from accumulating in them. The best application is a well-fitting elastic stocking. A bandage, unless of sufficient length to reach the middle of the thigh, and if, as is usually the case, carelessly and badly applied, will do more harm than good.

Inflamed Veins.—The large superficial vein of the lower limb may become solid, and form a hard and tender cord along the inner surface of the leg and thigh. The skin over this cord presents patches of a bright red colour, and the foot and lower part of the leg may become swollen and puffy. The patient is feverish and “out of sorts.” This inflammation is usually the result of injury to a vein which has for some time been swollen or varicose, or it may arise from an inflamed wound in the foot or leg, or from irritation of an old ulcer. It may occur also without injury in a gouty subject, or after a bad attack of fever.

Treatment.—The patient should be kept at rest, and the inflamed limb be raised on pillows and frequently fomented with thick flannels dipped in scalding water and then “wrung out.” The diet should be spare, and a dose of Epsom salts (two drams to a tumblerful of warm water) may be given every morning.

Every case of inflamed veins demands careful supervision. Although the pain and fever usually cease under simple treatment, and the hard and swollen vein afterwards slowly subsides, a slight indiscretion on the part of the patient, or exposure to cold or wet, will very likely be followed by fresh mischief, such

as abscesses, and even fatal blood-poisoning. Should the inflamed vein remain hard and tender after the fever and other sharp symptoms have disappeared, the use of poultices made of linseed meal and hot sea water will very probably do good.

ULCERS OF THE LEG.—Men serving on board ship, more particularly firemen, are very subject to ulcers or running sores of the leg. Young as well as old men may be thus affected, but the worst and most persistent forms of this affection are met with in those beyond the age of forty-five. There are various kinds of ulcer, each requiring a special treatment. The following are those most frequently observed:—

Inflamed Ulcer.—A bruise or graze of the skin in a feeble or unhealthy subject may be followed by inflammation and ulceration or breaking down of the injured surface. A painful sore is then formed which has a tendency to increase in size, and is surrounded by red and inflamed skin. If the man goes on working the sore, irritated by the motion of the leg and the rubbing of the clothes, becomes more and more inflamed and increases in size.

Treatment.—In such a case the man should rest in his bunk for a few days, the leg being raised, and lead and opium lotion (Prescription No. 4) applied frequently on lint or cotton wool to the sore. After the inflammation has subsided simple ointment should be used in the place of the lotion. Any attempt to walk or even to stand before the ulcer has quite closed will very probably be followed by fresh inflammation and breaking down of the skin into another large sore. The diet whilst the man is resting should be a light one.

Chronic Ulcer.—This is a very common form of leg ulcer. It is a deep sore with a smooth and grey surface, which is situated just above the ankle and almost always below the middle of the leg. It is often very large, and sometimes forms a ring around the leg. The adjacent skin is usually thick and tough, and of a deep brown or a purple colour. The veins of the leg are often swollen and form large and prominent cords (varicose veins). There is not much discharge from the raw surface, and in most cases the pain and discomfort are so slight that the man goes on with his work whilst on board ship, and, when paid off, often neglects to submit himself to suitable treatment on shore. Rest in bed for some weeks with strapping and bandaging may result in an apparent cure, but as soon as the man takes to his work again, and makes free use of his limbs, the scar breaks down and the leg resumes its former condition.

Treatment.—A man with chronic ulcer of the leg, if unable or unwilling to rest, should keep the raw surface and the skin near it clean by frequent use of warm water, and protect the sore by simple ointment spread on lint, and by a bandage carried from the toes to the knee. The bandage should be frequently washed, and, if it be possible, the man should be allowed a supply of four or more bandages.

A chronic ulcer if irritated by rubbing or injured in any way may become inflamed. Then the raw surface will be found red and puffy and covered by a discharge of thin "matter" with blood. The skin also may inflame, and be covered by minute blebs which discharge, on bursting, a thin and irritating fluid.

Treatment.—The treatment should consist in keeping the man at rest and putting him for a few days on light diet. The inflamed leg should be cleansed with warm water, to which a few drops of Friar's balsam, or *Liquor Carbonis Detergens* if this be at hand, might be added. The skin near the sore having been gently dried with cotton wool, the inflamed surface, together with the sore, should be covered by broad strips of lint or clean linen dipped in lead and opium lotion (Prescription No. 4).

In a hot climate, or after "fever and ague," or during an attack of scurvy, a chronic ulcer may increase rapidly in size and become sloughy and "rotten," the patient at the same time showing signs of extreme prostration. In such cases strong beef tea, with brandy or whisky, should be freely administered, and quinine in 5-grain doses, with a draught containing 10 drops of laudanum, be given every four hours. If there be any symptoms of scurvy, lime juice and fresh or preserved vegetables must be added. The black and sloughy ulcer should be dusted with iodoform, or, failing this, with sulphur, and the leg from the ankle to the knee be enclosed in strips of lint or linen saturated with carbolic solution (four teaspoonfuls to a pint of water), and a large pad of soft oakum.

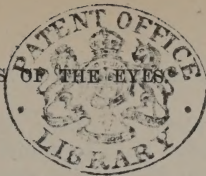
Tertiary Ulcers.—If a man have several painless open ulcers of varying size and form on one or both legs, some of which are high up and near the knee, and if there be similar sores in other parts of the body, together with large scars of previous ulceration, there will be no necessity to keep him at rest unless the skin of the affected leg be inflamed. Each sore should be dusted with iodoform and covered by simple ointment, or if iodoform be not at hand, be dressed twice daily with black wash. If the sores persist in spite of a fair trial of this local treatment, and continue to trouble the patient, iodide of potassium may be given three or four times daily in doses of 5 grains to a wine-glassful of water.

Blisters on the Feet may be caused by extreme cold, by the rubbing of rough and dirty socks, or by a loose boot. The blistered foot should be soaked night and morning in alum and warm water, and be afterwards powdered with flour or starch powder. The blister if small should be left alone, but if large and very troublesome be pricked with a fine needle. As the fluid runs away the loose skin should be allowed to settle down and to remain, the blistered part being afterwards covered by lint smeared over on one side with vaseline or soap. If the patient cannot rest, the inside of the sock should be well dusted with flour or smeared with soap.

Chilblains.—A chilblain, if not inflamed, may be painted with tincture of iodine, or rubbed with a piece of linen dipped in brandy or turpentine. The foot should be soaked at night in salt water. A useful and common application to chilblains is a mixture of spirits of turpentine and white vinegar (1 ounce of each) well shaken with the contents of an egg. If the skin breaks down into a sore, the man should rest, and the foot be dressed with warm lead lotion (1 dram of Goulard's extract to half a pint of distilled water), and after the pain and irritation have subsided, with Basilicon ointment spread on lint or linen.

Guinea Worm.—This is a thin white worm, usually about 3 feet in length, which burrows under the skin of the feet and ankles. It is met with most frequently in Africans, and is common in the shores of the Red Sea, in some parts of India, and in some of the West India islands. It gives rise to an abscess which, after it has burst, leaves a small discharging sore from which the end of the worm protrudes. A favourite situation is the heel.

Treatment.—The usual treatment is to withdraw the worm very gradually by winding the protruded portion round a small piece of wood (a wooden match), a quill, or a roll of paper, and taking two or three turns of this every day. This method, however, is not free from danger. If the worm be torn through, the remaining portion may set up much irritation and serious inflammation. The patient therefore, if at sea and deprived of a doctor's help, should simply keep the sore clean and pour over it every morning a canful of sea water. This will probably stimulate the worm to come away by itself.



CHAPTER XXV.

AFFECTIONS OF THE EYES.

Inflammation :—SIMPLE—CONTAGIOUS. Moon Blindness.

Inflamed Eyes.—There are two forms to which attention may be here directed—one, of redness and watering; the other, a much more serious one, of swelling of the under surfaces of the lids and the front of the eyeball, and a continuous and abundant discharge of thick milky fluid. The former is usually due either to cold or to the presence of some foreign body, as dust or a small piece of iron or coal, behind the lids, and is not catching. The latter is contagious, and may be caused by a drop of “matter” or pus being carried from the penis to the eye by the dirty finger of a man affected with gonorrhœa. The thick discharge in this form of inflamed eye often sets up inflammation of the other eye, and may, if carried to another person, cause like mischief.

The symptoms of simple inflammation are well known. The eye is red and painful, and the lids slightly swollen and moistened by a continuous flow of tears. If the trouble be due to a foreign body, the removal of this will be almost immediately followed by relief (see p. 154). If it be the result of cold, a lotion of sulphate of zinc (white vitriol, 2 grains; distilled water, 1 ounce) should be applied *inside* the eyelids by dropping it in from a small bottle, or through a quill. The patient's head should be thrown back and the eyelids gently separated. This should be done three times in the day, and in the interval the patient should remain protected from strong light and cold air, and bathe the lids frequently with hot water.

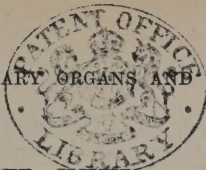
In cases of contagious inflammation, with much swelling of the lids and a constant running of thick white discharge, a lotion consisting of 10 grains of lunar caustic and 1 ounce of water should be applied every six hours, and *immediately* afterwards a few drops of a solution of common salt in water. The lotion if spilt over the lids or cheek should be immediately “mopped” up with cotton wool, as wherever it goes it will stain the skin. The patient should be kept in a darkened berth or cabin, and from time to time the discharge should be washed away from behind the lids by a lotion of alum (2 drams

to a pint of water), or better still, a lotion made by adding 20 drops of Condyl's fluid to a pint of warm water. The lotion should be applied thoroughly and yet carefully by means of a glass syringe. The diet should be a spare one and consist mainly of fluids—beef tea, barley water, and, if it be available, milk. Care must be taken to prevent any of the discharge reaching the other eye, which should be covered by a thick layer of wool. The attendant should wash his hands in a solution of carbolic acid (2 drams to a pint of water), or in crimson fluid and water (1 to 4), after the lotions have been applied by him.

In every case of inflamed eye in which the inflammation is not due to a foreign body or an injury, an examination should be made of the pupil or black disc in the middle of the clear portion of the eye. If this be irregular in shape, and the iris or surrounding curtain, which gives the colour to the eye be discoloured, and studded with small greyish or yellow masses, and if, at the same time, the small visible space in the front of the eye—the anterior chamber—is no longer clear and transparent but “muddy,” the case will probably be one of inflammation of the iris or coloured curtain, and need, not external applications, but blistering of the temple on the same side, and the *cautious* administration of some form of mercury.

Moon Blindness.—This affection, more generally known as *night blindness*, occurs frequently amongst seamen, especially those who are young and not yet accustomed to the diet on board ship. The patient though able to see well in the day, is unable to discern objects clearly in the dusk of evening and at night. It is caused in many instances by the glare of a fierce sun, or by sleeping on the exposed deck in a bright moonlight in the tropics. It is sometimes due to a poor or unsuitable diet, and is met with on shore in countries where long and strict religious fasts are observed.

A patient affected with moon blindness should be kept in a dark berth for two or three days, and be put on a good and nourishing diet, and during the voyage should avoid exposure of the eyes to any bright light. Two precautions should be taken by the master with regard to moon blindness. As a measure of prevention he ought to take care that, in the tropics, his men never sleep on the deck unless under an awning. Should any of his crew be affected he should at once look to the ship's dietary and take care lest there be a risk of scurvy breaking out on board.



CHAPTER XXVI.

DISEASES OF THE URINARY ORGANS AND BOWELS.

STRICTURE—ABSCCESS—EXTRAVASATION—RETENTION—INCONTINENCE—
SWELLINGS IN THE SCROTUM—RUPTURE—KINDS OF RUPTURE—
TREATMENT—PILES—PROLAPSES—FISTULA IN ANO.

Stricture.—This affection, so often met with in seamen, consists in contraction and, after a time, almost total closure of the urethral passage. The contraction, which, as a rule, is very limited in extent, is in most cases situated far back and near the bladder, but may be found near or at the outer opening. The worst and most obstinate cases are those in which the stricture has followed a fall on the fork.

Symptoms.—The most evident and troublesome symptoms are a frequent desire, both day and night, to pass water, and increasing difficulty in satisfying this desire. As the passage at the seat of stricture gradually closes, the stream becomes smaller until the patient can discharge his urine only in drops. In extreme cases there is continuous dribbling, the bladder becomes overcharged with urine and much swollen, and the general health suffers in consequence of pain, and of disease of the kidneys. In his own interest, as much as in that of others, no man who has once had stricture should "sign articles" for a long passage. The affection, though it may be removed for a time by hospital treatment, is practically an incurable one, and will almost inevitably recur, and then not only render him useless as a worker and a nuisance to the whole crew, but may place him, if there be no doctor on board, in a condition of extreme personal danger. Usually after hospital treatment the subject of stricture is supplied with a soft catheter, which he is requested to pass frequently on himself, but in most instances the instrument is either soon lost or broken, or the man neglects to use it.

Treatment.—The simplest treatment of stricture is to open up the contracted portion of the urethra by passing catheters or bougies (see Chapter xxxi.), beginning with an instrument small enough to go through the stricture, and using at intervals of two or three days larger instruments until one of No. 9 size can be readily introduced into the bladder. No hard or metal instrument should be used, but either a gum-elastic catheter without the wire, or a soft black catheter made with a bulb near the end. This treatment, unless the patient can be kept at

rest for some days, is not free from risk, as the passage of even a very small catheter may excite much "shivering" and fever, and the instrument itself, if not perfectly clean and well oiled, may set up irritation in the urethral canal and bladder.

Passing a Catheter—The patient should lie on his back with his head and knees raised. The catheter must always be well greased with sweet oil or vaseline, and, if it be a metal one, be first warmed by dipping it in hot water or by rubbing it on rough cloth. In passing a soft and straight instrument, which should be used in preference to a hard and curved one, the penis should be stretched. The catheter, held between the thumb and forefinger, is then inserted and passed gently along the urethral passage. If it meet with any obstruction it should not be forced, but withdrawn a little way, and then passed on again with the penis, which is still stretched, in a different position, being either raised towards the belly or depressed between the legs. In using an instrument on a patient for the first time, one should begin with No. 7, and if this fail, afterwards try smaller instruments in succession down to No. 1. The best way of passing a curved metal catheter, *which, however, should never be used except when a soft instrument is not available, or when such has been tried and has failed in an urgent case*, is to introduce it into the stretched penis from the patient's left side, and with the concave portion over his left groin. As the instrument is directed along the penis, the handle should be slowly directed inwards until it is in a line with the navel. After its point has passed the purse, the handle should be *gently* lowered, and if there be no obstruction, the instrument may then slip into the bladder.

In passing a catheter or bougie, one should stand on the left side of the patient.

Any attempt to reach the bladder, whether by a soft or a hard catheter, should not be continued for more than ten minutes at a time.

If there be no flow of urine, though the point of the catheter is evidently in the bladder, the patient should be told to cough, or a thin wire may be passed along the catheter.

A patient suffering from stricture is constantly exposed to the dangers of the following complications:—

1. **Complete Stoppage or Retention,*** see p. 220.

*When the bladder is full of urine but cannot be emptied in consequence of weakness of its muscular walls, or of obstruction in the urethral passage, the patient is said to be suffering from *retention*. When the patient cannot pass water for the reason that there is no water in the bladder, and that the kidneys, as a result of disease, no longer secrete this fluid, the condition is known as that of *suppression* of urine.

2. **Abscess.**—The urethral canal behind the stricture may gradually give way and allow a small quantity of urine to leak into the deep parts of the fork. Irritation is thus set up, and a painful abscess is formed, which, after it has reached the skin and burst, discharges “matter” mixed with urine. The opening does not close like that of a simple abscess, but remains an open sore from which there is an almost constant dribbling of urine. In cases of old and neglected stricture, other abscesses may appear from time to time in the fork or on the purse, leaving openings through which almost the whole of the urine is discharged.

Treatment.—The painful and inflamed swelling in the fork should be treated by rest in bed and poulticing, and if the skin be much inflamed and raised may be cut with the point of a sharp and clean lancet, which has been immersed for two or three minutes in boiling water. The open sore, so long as it is inflamed and discharges much purulent matter, should be covered by a layer of oiled lint or linen and, over this, a thick pad of carded oakum.

3. **Extravasation.**—The urethra behind the stricture may give way *suddenly*, and a large quantity of urine be poured out or *extravasated* through a wide rent, into the deep structures of the lower part of the body. The patient feels some relief for a short time but soon suffers from burning pain in the purse and groins. The purse and penis become much swollen, and the skin of these parts, together with that of the lower part of the belly, becomes stretched and inflamed, and in the course of two or three days is marked by black gangrenous patches which break down into open sores, from which there is a profuse discharge of ill-smelling “matter” mixed with foul urine. Most of the skin of the purse may be thus destroyed, the testicles being exposed.

Treatment.—This, although a very grave, is not a hopeless condition, if the patient be well nourished and carefully nursed. He should be kept apart from the rest of the crew in fresh air; if the weather permits, on deck under an improvised tent or in a small boat. If the purse be much swollen a deep and long cut should be made into it at its lower part, and just midway between the testicles. Strong soup and beef tea, with eggs, bottled stout, and brandy or whisky should be given freely and frequently. The swollen and inflamed parts should be covered at first by hot fomentations, and, after the black and mortified skin has given way, and when there is much discharge, by thick and oft renewed pads of oakum. If the patient suffer much from pain and restlessness an opium pill (5 grains) may be given every six hours until relief has been obtained.

Retention or Stoppage of Urine.—A man who has not suffered from any previous difficulty in passing water, may, after free drinking on shore or during an attack of gonorrhœa, suddenly find that he cannot relieve his bladder. As the urine collects he makes violent and straining efforts to pass it, and if the stoppage has persisted for twelve hours or more, he suffers from severe pain over the bladder and across the loins. There will probably be a large round swelling in the lower part of the belly, formed by the over-distended bladder. A like condition may result from prolonged exposure to wet and extreme cold.

Treatment.—In cases of sudden stoppage, no attempt should be made to pass a catheter until other measures have failed. The man should be kept in a hot bath (100°) for about half an hour, and afterwards remain at rest on his back, being well covered by thick blankets or canvas. He should then take a draught of laudanum (20 drops to an ounce of water), and be well and frequently fomented over the bladder by flannels wrung out in scalding water. If no water be passed in the course of three hours after the hot bath, a gum-elastic catheter (No. 5 or 6), without the wire, should be gently passed along the penis. If this should fail, a repetition of the hot bath and another laudanum draught will very probably give relief. In using the catheter very little force should be applied, and if there be any bleeding the attempt to pass the instrument should be given up. In most cases, rest, warmth, and laudanum will after a time overcome the obstruction and give relief.

Retention may occur as a result of stricture. In most cases of this affection, and even in those in which the smallest catheter cannot be passed into the bladder, the patient is able to get rid of a fair quantity of urine every day. However, if the urine be discharged in a very small stream or in drops, a considerable quantity may collect in the bladder; or exposure to cold, active exercise, or a glass of ale or spirits may cause complete blocking of the passage. The bladder will then be much distended and the patient suffer from intense pain in the back and groins, and strain violently in order to relieve himself. In such cases a hot bath should be given at once, and afterwards the patient should rest in his bunk and take a laudanum draught (30 drops to 1 ounce of water). No attempt should be made to pass an instrument for the first twelve hours, as any irritation of the passage might cause the strictured portion to swell and to close still more. Hot baths, rest in bed, and the application of hot flannels over the lower part of the belly will very probably give some relief and be followed by dribbling of urine. Should, how-

ever, the symptoms be very urgent and the stoppage persist in spite of prolonged treatment of this kind, a small gum-elastic catheter (No. 1 or 2) should be passed very gently and slowly along the passage and, if possible, into the bladder. The patient, if he has been in the habit of passing an instrument, should do this himself. If this fail, the man must be kept at rest and be relieved by hot baths and fomentation, and occasional draughts of laudanum, until the *earliest* opportunity occurs of calling on a medical man.

Complete stoppage of urine in a man over sixty, who in middle age was free from symptoms of stricture, is usually the result of obstruction at the neck of the bladder caused by an enlarged prostate, and may in most instances be relieved by passing a soft or gum-elastic catheter of full size (No. 8 or 9). The instrument should be passed without the wire and be either quite straight or turned up near the closed end. If the urine be thick and foul, the patient should, whilst at sea, pass the catheter himself two or three times every day.

In cases of low fever and severe injury, in which the patient remains for some time prostrate and more or less unconscious, and also in cases of injury to the spine, enquiry should always be made as to whether urine has been passed or not. If no urine has been passed for some hours and the bladder be overcharged, a gum-elastic catheter (No. 8 or 9) should be used every six or seven hours so long as the patient is unable to obtain natural relief.

Dribbling or Incontinence of Urine.—"Wetting the bed" at night occurs frequently in boys. In most instances this, which is an unavoidable ailment, and not a mere "bad habit," ceases as the boy grows up, but occasionally remains until he is a big lad, and whilst it lasts causes much discomfort and annoyance. It may be arrested by rousing the patient at the end of each watch and making him pass water,* but usually persists in spite of this treatment, and necessitates his discharge from the ship in order that he may undergo a course of medicine or a surgical operation.

Dribbling of urine may, in some few instances, be the result of disease of the spinal marrow, but usually, in grown-up men, is due either to stricture or to enlarged prostate. In such cases the bladder is not, as might be supposed, empty, but too full. This distension will very probably be due to stricture if the patient be a man of middle age, to prostatic disease if he be above the age of fifty-five.

* Dr. Harry Leach, *The Ship Captain's Medical Guide*.

Precautions.—In either case it would be well to keep the patient at rest until he can be removed for medical treatment, as the relief of an over-charged bladder in such cases, and especially in an old man with enlarged prostate, is liable to be followed by serious symptoms.

Swellings in the Scrotum or Purse.—If the swelling has come on rapidly after a blow or an attack of gonorrhœa, and the skin be red and tender, the case should be treated, as one of “swollen” or inflamed testicle, by rest, low diet, and fomentations, or warm lead lotion (see Prescription No. 5).

A soft and painless swelling on one side of the scrotum, that can be readily pushed into the belly, and returns and becomes full and distended when the man coughs, should excite suspicion of a rupture (see below), and, if it disappears altogether when pushed upwards, and leaves the scrotum and groin quite free, should be prevented from coming down again by a truss.

Varicocele is a swelling on the left side of the scrotum, which swells when the patient stands up, and diminishes or subsides altogether when he lies down. The swelling, which is formed by swollen veins, is soft, knotted, and uneven, and feels like a bag of worms. This affection, which is met with usually in lads, is not in itself a very serious one, and needs no special treatment, beyond the use of a suspensory bandage, and frequent sponging with cold water. In the selection of a ship’s crew, however, anyone affected with varicocele ought at once to be rejected. Such subjects often suffer much from pain in the swelling, and are disposed to attach too much importance to their malady, and to attribute it to overwork or to some slight accident.

Other slow and almost painless swellings of the scrotum, such as hydrocele or dropsy of the bag of the testicle, chronic inflammation of the testicle itself, and tumours, do not, as a rule, interfere very much with the patient’s general health and capacity for work, and may, in most instances, be left for proper treatment on shore. In every case of scrotal swelling, however, the man should be advised not to lose time, as in many forms of such swelling, particularly those due to tubercle and cancer, much serious mischief may be prevented by timely surgical treatment.

Rupture (*Hernia*).—A person is said to be ruptured when a portion of the bowels, with or without a portion also of the caul, escapes from the belly and forms a swelling under the skin. The swelling, which protrudes through a small opening in the abdominal wall, gradually increases in size if not properly treated, and in some instances contains many feet of bowel together with masses of fat. The usual situations of rupture are the

groin (*inguinal rupture*), the upper and inner part of the thigh just below the groin (*femoral rupture*), and the navel (*umbilical rupture*). By far the most frequent form in men is the inguinal rupture, which begins, in most cases, as a rounded swelling on the groin, and makes its way into the purse. Umbilical rupture is often very large, and femoral rupture always small. Both these varieties are very rare in men. Rupture may occur at any age, but often comes on suddenly in adults during forced muscular exertion.

In most instances a rupture can be readily returned or *reduced* into the belly; in some few it remains fixed, either in consequence of its large size, or of the very serious condition known as strangulation.

A *reducible rupture*, or one that can be returned, forms a smooth, elastic swelling, which enlarges when the patient coughs, and, after it has been pressed back by the hand, quickly returns when he stands up. So long as the rupture remains in this condition it is not a very serious affection, but as it will certainly increase in size, and may *at any moment* become strangulated, the patient should without delay be supplied with a suitable and well-fitting truss (see Chapter xxxi.).

When the swelling, though still soft and painless, cannot be pushed up into the belly it is said to be *irreducible*. In these forms of rupture the swelling is usually very large, and contains firm masses of caul. No man with an irreducible rupture ought to undertake the work of a seaman. The swelling will be constantly in the way, and is liable to be bruised and severely injured. As an ordinary truss would be of no service—indeed it would do harm—the swelling is usually suspended by a special bag.

Strangulated rupture, always a serious affection, is especially so to a man who is unable to obtain prompt and skilled surgical help. In this condition the rupture is so squeezed at the opening in the abdominal wall that it cannot be returned, and, at the same time, the protruded portion of bowel becomes so swollen and engorged with blood as a result of this squeezing that in the course of a few days it mortifies and gives way. Strangulation may occur in an old rupture that is not properly supported by a truss, or it may come on at once in a rupture suddenly produced by injury or overstraining.

Symptoms.—As the bowel in the rupture is so squeezed that nothing can pass through it, the chief symptoms of strangulation are such as are due to stoppage of the bowels—viz., constipation, swelling of the belly, pain in the hernia and about

the navel, and vomiting at first of a greenish fluid, and afterwards of a fluid having the appearance and smell of fluid stools. This kind of vomiting, which is called *stercoraceous*, is a very serious symptom, and when occurring in cases in which no mention is made of a rupture, should always lead to an examination of the patient's groins and navel.

Treatment.—Unless a strangulated rupture can be returned, the patient will almost certainly die in consequence, either of exhaustion, or of rupture and inflammation of the bowels. In most cases a fatal ending cannot be averted except by an operation which only a professional man can perform. In every case, however, persevering efforts should be made to relieve the patient by giving at first a hot bath, and afterwards by keeping him in bed and applying ice, a freezing mixture (see Chapter xxxi.), or cold sea water to the rupture. No food or drink of any kind, save sips of cold water, should be given. If the patient complain much of pain in the belly fomentations should be applied, and a laudanum draught (15 drops of laudanum to an ounce of water) or an opium pill (5 grains) be given every four hours. Should the rupture become soft, an attempt may be made to return it by squeezing the swelling very gently with the fingers. If the rupture be an old one the patient should do this for himself. Prolonged and forcible efforts to reduce the swelling will do more harm than good. By far the most important object in such cases, is to obtain with the least possible delay proper surgical treatment.

Piles (*Hæmorrhoids*).—These are small swellings, seated either within the lower bowel or at and around the anal vent. The former, which are soft, red, and apt to bleed, are called *internal or open piles*; the latter, which are much firmer, and consist of dry and swollen skin, are known as *external or blind piles*. These growths are very common in middle-aged men who have indulged freely in alcohol, but in many cases give little trouble so long as the patient is actively engaged and remains in a cool climate. They are often much aggravated by a prolonged stay in the tropics, and become enlarged and painful after constipation, and congestion of the liver.

The internal pile is a round spongy swelling of a deep red colour, which comes down when the bowels are relieved, and afterwards usually ascends again into the rectum. There are generally several of these growths, which, as they increase in size or become swollen from time to time, cause much discomfort within the anal vent, and pain in the back. The most serious symptom in most cases is bleeding, which may be very profuse,

but more frequently consists in the discharge of a few drops of blood at each stool, causing a gradual and long-continued drain on the system, and producing in course of time extreme weakness, and pallor of the face and lips. A slight and temporary discharge of blood will do good rather than harm when the piles are swollen or inflamed.

Sometimes the piles when protruded at stool are caught by the circular muscle which closes the end of the bowel, and their return is thus prevented. In such case they swell to a great size, give the patient intense pain, and, if not returned, mortify and drop off.

Treatment.—A person troubled by internal piles should be temperate both in eating and drinking, and endeavour to relieve the bowels frequently, not by strong medicine, but by gentle aperients such as castor oil, senna, and sulphur. A paste made by mixing sulphur and cream of tartar (half a dram of each), with a little treacle or honey, will be found beneficial if taken every night. The piles when protruded at stool should be well sponged with cold water. If the swellings come down when the patient is at work, and get inflamed, ointment of “galls and opium” should be applied on a piece of linen. In cases in which the piles descend in a large mass, and become swollen and very tender, the patient should lie on his side and an attempt be made to return them by covering the red protrusion by a piece of lint dipped in sweet oil, or smeared on the side next to the piles with vaseline, and by gently squeezing and pressing on the swelling, so as to force it gradually into the bowel. If this cannot be done the patient must be kept in bed, and cold water be constantly applied by means of a sponge. If a man has suffered much from piles, and lost much blood during a voyage, he should be advised to take the warning, and place himself under surgical treatment when he arrives in port.

External or blind piles are growths of thickened skin, situated on or near the margin of the opening into the bowel. These in themselves rarely cause much discomfort, but are usually associated with internal piles. An external pile, however, may swell and become very tender, so as to prevent the patient from moving about.

Treatment.—The only treatment needed for external piles, under ordinary circumstances, is to keep them clean and dry, and if they give trouble in hot weather, to dust them with starch powder or some flour. Should one of these growths become very tender and show a blue speck on its summit, a deep prick with a lancet will often give relief.

In **Prolapsus** a portion of the gut comes down and forms a swelling outside the anal vent. This swelling resembles internal piles in colour, but differs from these in presenting not two or more separate growths, but a smooth and even ring, in the centre of which is the opening into the bowel. Prolapsed gut, like piles, always comes down at stool, and often when the patient is standing or at work. It may become swollen also when protruded, and give some trouble before it can be returned.

Treatment.—The treatment of prolapsed gut, so long as the patient is deprived of surgical aid, should be that recommended for internal piles :—Cleanliness, frequent relief of the bowel by mild aperient medicine, the application of cold water, and, when the protrusion is irritated and inflamed, of “gall and opium” ointment. When the red mass is very large and cannot be readily returned by the patient, it should be squeezed and pressed upwards as in the case of irreducible internal piles.

In **Fistula in Ano** there is a constant discharge from a small sore in the fork, which is the external opening of an unnatural canal or fistula leading into the bowel. This local affection which gives trouble by reason of the constant moisture of the skin around the opening, and of the frequent discharge of gas through the canal, over which the patient has no control, is curable only by a surgical operation.

Management.—All that the patient can do whilst at sea is to keep the fork clean and to cover the discharging sore by a piece of linen smeared with vaseline, and over this a pad of oakum.

CHAPTER XXVII.

VENEREAL DISEASES AND SYPHILIS.

Gonorrhœa — **BALANITIS** — **PHIMOSIS** — **PARAPHIMOSIS** — **RETENTION OF URINE** — **SWELLED TESTICLE** — **GONORRHOËAL OPHTHALMIA** — **GONORRHOËAL RHEUMATISM** — **GLEET** — **Chancres** — **Soft Chancres** — **Hard Chancres** — **Secondary Syphilis** — **Tertiary Syphilis**.

Gonorrhœa (Clap). — **Symptoms.** — Commences about three or four days after connection—sometimes later—with slight smarting along the passage and a discharge of clear fluid. The troublesome symptoms of this common affection amongst seamen rapidly increase in severity. The patient complains of frequent

desire to pass urine and of sharp scalding pain during the act. There is a constant and profuse discharge from the entrance to the passage, the discharged fluid being thick and of a white or greenish-white colour. The end of the penis or yard is red and inflamed, and the edges of the orifice are swollen, so that there is some difficulty in getting rid of the urine, and the stream is small and twisted. During the sharp stage, which lasts about a week, the symptoms which cause most trouble are a scalding pain along the passage and frequent attacks of painful erection, with twisting and bending of the organ (*chordee*). If the patient is able to rest and to submit to treatment, this stage is soon followed by that of decline, during which the pain and swelling gradually cease, and the discharge from the passage becomes thinner and less abundant. These symptoms, however, may disappear very slowly, and any carelessness on the part of the patient, either in diet, or in exposure to wet or cold, is very liable to result in a renewal of the severe troubles of the acute stage. The patient can very seldom be regarded as quite well before the end of the fifth week. An attack of gonorrhœa is often followed by a very obstinate and prolonged discharge of a pale sticky fluid (*gleet*).

Treatment.—In the treatment of gonorrhœa very little can be done unless the patient is able to rest and willing to submit himself to restrictions in diet and general habits. Ale, wine, and spirits, and even tea and coffee, should for a time be regarded as poison. During the acute stage, when there is much pain in passing urine, and abundant discharge, and when the patient is anxious to obtain relief at any cost, he should be persuaded to content himself with a very low diet, consisting merely of eggs, milk, and water, and, if available, effervescing water. The bowels should be freely relieved by repeated doses of Epsom salts (half an ounce in a wine glass of warm water, once on the first day, and on the next two or three days one dram every morning). Much relief may be given by bromide of potassium (half a dram in a wine glass of water) taken every four hours. Whenever the urine is passed, the penis should be immersed in hot water. If the end of the organ be red and painful, it should be wrapped around by a long and narrow strip of lint frequently saturated with lead and opium lotion (Prescription No. 5).

The best remedies for *chordee* are camphor and bromide of potassium. If a large bath cannot be obtained, the patient should take a hot hip bath, or bathe the genitals and the fork or crotch (perineum) with very hot water. The most suitable

time for doing this is just before turning in, when a draught of camphor (Prescription No. X.) should be given. Whilst in his bunk the patient should be lightly clad, and have but a thin covering over him.

When the severe symptoms have abated, and there is less scalding in making water, the restrictions as to diet and movements may be much relaxed. The patient may now return to his ordinary diet, but so long as the discharge lasts must not take beer, spirits, or tea. The best remedy during this stage is *copaiba*, taken either in capsules or in mixture (Prescription No. II.). This should be given three or four times daily, and be continued until the discharge has ceased. *Copaiba* must be discontinued for a few days, and bromide of potassium again given, if at any time through imprudence, or exposure to wet or cold, the patient suffer from a renewal of the more severe symptoms (much pain and scalding, and frequency in making water), and also, if, as sometimes happens, its use is followed by sickness, much diarrhœa, and pain across the loins.

The use of injections, though commonly regarded as indispensable in the treatment of gonorrhœa, cannot be recommended here, for the reason that unless skilfully applied and properly controlled, such remedies often fail to do good, and may cause serious and permanent harm.

Cautions.—Gonorrhœa should never be neglected, because not only is it a troublesome and painful affection in itself, but it is apt to be associated in its course with one or more of the following disorders :—

Balanitis, or External Clap.—In a patient with a long foreskin and a small opening, the discharge from the passage may collect and set up inflammation at the end of the penis. In such cases there is much swelling and redness of the foreskin, and a profuse discharge from the small opening of very thick and ill-smelling fluid. If the foreskin can be drawn back without difficulty, the end of the penis should be exposed and thoroughly cleansed by warm water. This should be done several times during the day, and after each cleansing the exposed end of the penis should be covered by a small piece of clean lint, over which the foreskin as it comes back may be allowed to pass. If the foreskin cannot be drawn back—and care should be taken never to do this by any violence—warm water should be frequently injected between the foreskin and the nut or glans of the penis by means of a small glass syringe. A few drops of Condyl's fluid (10 drops to a tumblerful) may be added.

It should be remembered that external clap may exist without

gonorrhœa, and be the result of dirty habits and self-neglect, not of sexual indulgence.

Phimosis.—Swelling and inflammation of a long foreskin. The end or glans of the penis cannot be uncovered, the discharge from the passage collects under the foreskin, and there is difficulty in passing water. This condition passes away as the patient recovers from his gonorrhœa; but care should be taken, whilst it lasts, to keep the parts clean by frequent injection of warm water under the foreskin.

In **Paraphimosis** a reverse condition is presented. The foreskin is drawn back behind the nut and cannot be brought forwards. This is a more serious state of things than phimosis, though much less frequent. The retracted foreskin is much swollen, and forms a very thick ring, the surface of which is tightly stretched and very glossy.

Treatment.—In cases of gonorrhœa in which there is much pain and swelling at the end of the penis, the swollen foreskin should be pricked at about a dozen points by a sharp sewing needle, which has been previously immersed in a solution of carbolic acid or in boiling water. The penis should then be covered by lint dipped in lead and opium lotion.

Paraphimosis often occurs quite independently of gonorrhœa, or any other form of bad disorder, in boys, after attempts to pull back a long foreskin. In such cases the condition, if taken in good time, can be removed without much difficulty, though not without causing pain, by squeezing the nut and at the same time pulling forwards the swollen and retracted foreskin by the thumb and forefinger of the other hand.

Retention of Urine, or inability to pass water, may occur during the acute stage of gonorrhœa. In such cases the patient usually has either had a stricture, or has indulged freely in drink, or neglected himself very much during the gonorrhœal attack.

Treatment.—The most suitable treatment for this complication would be a hot bath and frequent fomentations to the lower part of the belly. The bromide of potassium mixture should be given every three hours during the attack. If no relief be afforded by the end of twelve hours, 30 drops of laudanum should be given in a wine glass of warm water. If complete rest, bathing, and medicine all fail to give relief, an attempt should be made to pass a soft bulbous catheter, beginning with No. 6 and using smaller instruments of the same kind down to No. 1, if there be any difficulty in reaching the bladder. After such use care must be taken to cleanse the instruments thor-

oughly and to immerse them for five minutes in a strong solution of carbolic acid. This complication, though very painful and alarming, usually passes off as the severe symptoms of gonorrhœa become relieved, and need not cause anxiety or a recourse to violent instrumental treatment.

"Swelled Testicle" is a frequent complication. It may be the result of carelessness and alcoholic indulgence, of or exposure to cold and enforced exercise. It is believed also by many surgeons that it may be due to the use of strong injections.

Symptoms.—The affected testicle suddenly becomes swollen and very tender, and the skin covering it is red and inflamed. The pain often extends to the groin and lower part of the belly. There is much constitutional as well as local disturbance, the patient being very feverish, depressed, and unable to take or retain any kind of food.

Treatment.—This affection, which soon passes off, should be treated by giving Epsom salts with Dover's powder (Prescription No. XI.) every three or four hours until the bowels are freely relieved, and by applying fomentations of very hot water to the swollen testicle. The patient ought to be kept in bed, and the testicle supported on a strip of adhesive plaster, 4 inches in breadth and 2 feet in length, fixed across the front and upper parts of both thighs, with the sticking surface applied to the skin. A broad bandage fixed around the thighs will answer the same purpose.

A still more severe, but less frequent, complication is a deep-seated "gathering" in the fork between the purse (scrotum) and the anal vent. The fluid matter is bound down by thick and tough structures, and comes to the surface slowly. The patient suffers much from pain and general disturbance. There is a decided swelling in front of the anal vent, the skin over this is red, and the least pressure on it causes much distress. This condition may be suitably treated by rest in bed, hot fomentations to the painful part, and, if the skin be very red and the swelling large and soft, by a short incision (about half an inch in length) made exactly in the middle line—from before backwards—of the fork.

Gonorrhœal Ophthalmia—Symptoms.—It sometimes happens that, in the course of an attack of gonorrhœa, the patient complains of itching inside the lids of one eye, and of discharge. The lids rapidly swell, so that the eyeball is completely covered in, and there is a profuse discharge of thick irritating "matter." This condition, which is very probably due to some of the discharge being carried on dirty fingers from the penis to the

affected eye, is a very serious one, as it often causes blindness in the organ first attacked, and is very apt to spread to the other eye, and to produce in it like mischief.

Treatment.—The affected eyelids should be separated if possible and frequently syringed with warm water. Very cold applications, ice if available, should be constantly applied over the swollen lids. If the swelling and discharge persist and the pain becomes very severe, an attempt should be made to evert the lids, to cleanse their inner surfaces with warm water, and to apply to the thick and pulpy swelling a strong solution of nitrate of silver (caustic), or even the solid stick. The application of the solution of caustic (10 grains to the ounce) should be immediately followed by the application of a solution of common salt (two teaspoonfuls of salt to a wine glass of warm water). The opposite eye should be very carefully protected by a pad of iodoform or carbolic gauze, and over this a thick layer of cotton wool. These pads should be securely fixed by a bandage, and, if any collodion be available, may be “glued” to the skin surrounding the eye-socket.

Gonorrhœal Rheumatism.—In the course of an attack of gonorrhœa—usually when the more severe symptoms have been relieved—the knee or ankle may become swollen. If a man, who is not a rheumatic subject, and has not recently received any injury to the lower limb, complains of swelling of either of these joints, and the skin over the swelling be not red or inflamed, it will often be found that he has a discharge or “running” from the penis. The joint affection, though not an acute or sharp one, is likely to be troublesome, since not only does it cripple the patient for a time, but it also resists treatment, and often disappears very slowly. It is often attributed to injury to the joint, or to ordinary rheumatism. In case of contusion or injury there would very probably be some bruising. Acute rheumatism or rheumatic fever would be characterised by high fever and other general symptoms, and in chronic rheumatism several joints, including those of the upper limb, would be found affected.

Treatment.—Gonorrhœal swelling of the knee or ankle may be suitably treated by rest, the application of a flannel bandage, and by steady administration of copaiba or, if available, cubebs (half to one dram), with the view of arresting the gonorrhœal discharge. If the swelling persist, and continue to prevent full or good use of the limb, it would be well to apply mercurial ointment smeared on lint, and to cover this by a firmly applied calico bandage, or, better still, by Martin’s elastic bandage. Should the patient be weak and pale, the diet might be im-

proved, and a little quinine (about 5 grains) be given in powder every morning.

Gleet is a frequent result of gonorrhœa, either following the attack directly, or coming on about two or three weeks after it has been apparently cured.

Symptoms.—It consists in a thin sticky discharge, never very abundant, and usually observed on rising in the morning, and just staining the shirt in the course of the day.

Cautions.—It is not a painful or disabling affection, but should not be neglected. In a sensitive patient it is apt to excite much worry and mental depression, and, moreover, so long as the discharge continues, any indulgence in drink or sexual intercourse will probably result in a fresh attack of gonorrhœa.

Treatment.—It may in most instances be cured, though slowly, by good diet, without beer or spirits, fresh air, and moderate exercise, and by a mixture of tincture of steel and quinine (Prescription No. IV.), a wineglassful to be taken three or four times daily. If the discharge should persist, after a long trial—from two to three weeks—a bulbous bougie (No. 8 or 9), smeared with iodoform ointment (Prescription No. 6), may be passed along the passage as far as the bladder, or an injection may be made, by means of a glass syringe, of cold green tea. In very obstinate cases a small blister to the fork between the purse and the anal vent may do good.

A very persistent gleet discharge, associated with some difficulty in making water, and with a diminishing stream, indicate that the patient is probably about to suffer from stricture—one of the most serious results of gonorrhœa (see p. 217).

Chancres.—Of sores caused by impure connection, there are two forms—the *soft* and the *hard*. It is very important to distinguish the one from the other, as the soft chancre is not likely to give rise to syphilis (pox), and so does not require internal mercurial treatment.

Soft Chancre.—Most frequently met with on the glans (nut) or on the margin and outer surface of the foreskin. When only one is seen, which is a rare event, this is soon followed by others. There are usually three or four collected in a group.

Symptoms.—Each chancre commences as a minute pimple or boil, which soon breaks down, and forms a deep ulcer of rounded shape with sharp edges, as if cut with a punch, and an uneven surface. From this surface there is a profuse and continuous discharge of white matter. The surrounding structures are, as a rule, healthy, and not swollen or hardened. The soft chancre

makes its appearance very soon after connection, often on the second or third day. If not submitted to treatment it continues discharging for four or five weeks, and sometimes gives rise to a large and painful abscess (suppurating bubo) in one, or, it may be, in both groins.

Treatment.—In dealing with soft chancres, pains should be taken to keep the ulcerated parts as clean as possible, as the discharge, if applied to any open place, either on the patient or on another person, will very likely produce similar sores. The small ulcers should be cleansed with warm water, then be carefully dried, and “dusted” with iodoform powder. This should be done three or four times in the twenty-four hours, and, after each dressing, a strip of iodoform gauze or of clean lint should be inserted between the glans and the foreskin, and the end of the penis enclosed in a layer of clean cotton wool. If iodoform be not at hand, the best substitute would be blackwash (Scale of Medicines, see p. 36). There is no necessity to give any medicine, and the internal use of mercury must be carefully avoided.

The soft chancre, together with the surrounding parts, may become much inflamed and break down into a large and rapidly spreading ulcer (sloughing phagedænic ulcer), which, before its ravages are arrested, will destroy much of the penis. The whole organ is much swollen, and its surface of a deep red colour mottled by livid and black patches. There is a profuse discharge of thin ill-smelling fluid. The patient becomes very feverish and suffers severely with pain. This condition, which, fortunately, is rarely seen now, occurs in most instances as the result either of foul connection in a hot climate, or of hard work associated with prolonged privation and exhaustion. The foreskin in cases of this kind is usually long and its orifice contracted.

As continuous bathing does much good in sloughing chancre, the patient, if the weather be warm and necessary means be available, should be kept immersed for two or three hours daily in a cold or tepid bath of sea water. He should, in order that he may have fresh and pure air, be kept apart from the rest of the crew, if possible under canvas in some selected part of the deck. Laudanum (10 drops to a wine glass of water) should be given every four hours, and the general strength be supported by strong beef tea and brandy. The ulcerated parts should be thoroughly “swabbed” twice daily by a solution of Condyl’s fluid (two tablespoonfuls to a pint of warm water) applied by cotton wool or fine tow. The swollen penis should then be

covered by strips of lint or linen saturated with a much weaker solution, and be well packed in a large mass of oakum. The dressings when removed should be at once thrown overboard or burnt.

Hard Chancre.—This form of venereal sore, if regarded simply as a local affection, is much less severe than the soft chancre. Indeed it is often so insignificant as to escape observation, and by careless and dirty men is seldom submitted to treatment.

Symptoms.—It consists usually of a raised pimple with a slightly ulcerated top which is covered by dry scales. The discharge, if there be any, is slight and the sore is free from pain. It may affect any portion of the glans (nut) or foreskin, but is most frequently found on the back part of the glans. Unlike the soft chancre, it is single and makes its appearance in the course of the third or fourth week after connection. This is called a *hard chancre* because it is often set as it were in a rim or zone of hard structure which feels, when squeezed between the fingers, like a piece of gristle, or a split pea. This is an important distinction, as a sore of this kind is almost invariably the starting-point of syphilis (pox), the earliest symptoms of which—generally skin eruption, falling off of the hair, and sore throat—will very probably appear some five or six weeks later. The probability that a sore of this kind on the penis will be followed by syphilis will be increased by the presence in both groins of slightly enlarged and very hard glands feeling like small marbles or unshelled almonds.

Treatment.—A hard chancre should be kept clean and carefully protected from irritation. The most suitable dressing is black wash. This lotion should be well shaken in its bottle until it is quite black, and then be poured into a small gallipot or a saucer over pieces of lint or linen. Here it should be allowed to remain, so that each piece of lint as it is taken out for a fresh dressing may be found well covered by the black deposit.

An excellent rule has been laid down that mercury should rarely if ever be given as a medicine by any unprofessional person. To this rule, however, an exception might be urged in instances of obvious hard chancre, for if, as there are good grounds for believing, the early administration of mercury will prevent secondary syphilis, or at least lessen its severity and retard it, a strict observance of this rule would certainly do more harm than good by withholding the only means by which the patient could be guarded against a very serious and persistent

malady. It would be well then, in cases of this kind, to administer mercury in some mild form, as, for instance, a quarter of a blue pill twice daily, or, if it be available, grey powder in 1 grain dose every four hours. If strict attention be paid to the directions given on Chapter xxx., such treatment may be continued without risk for several weeks.

Secondary Syphilis begins usually in the course of the fifth or sixth week after the first appearance of the hard chancre, but may appear earlier. It is really a form of blood-poisoning which manifests itself by a great variety of affections in different parts and organs of the body. It may take a mild and almost unheeded course, but in men of irregular and intemperate habits, or who have been exhausted by other diseases, by hard work under privations, or by a hot climate, it is often very severe. The following are the most frequent symptoms, which seldom appear singly, but are generally associated together, most or all of them at the same time.

Skin Eruption.—Dry raised spots of a reddish-brown colour, and “tipped” by light scales; most numerous on the forehead, on the chest and belly, and on the *front* of the arms and legs. These spots are not inflamed or “angry,” and do not itch. In this respect, and also from their conspicuous presence on the forehead, they differ from the spots observed in “itch” or scabies.

The scalp is very scurfy, and the hair becomes dry and loose, and falls off readily when combed.

Behind the ear and along the back of the neck, on either side small and hard lumps may be felt. These are enlarged glands.

The eye sometimes becomes painful, watery, and slightly inflamed. The large dark circle in the centre of the “white” of the eye is muddy, and the iris or curtain, which gives the colour to the eye, has lost its proper tint. On examining the margin of this iris, which usually forms an even circle, it will be found irregular, and, perhaps, dotted with small yellow specks.

The throat may become sore, and the tongue swollen and marked by white patches or superficial ulcers. The lips are usually dirty, and at one or both corners of the mouth may be seen deep sores with ragged edges. These symptoms are frequently observed in smokers. Rheumatic pains in the joints, and severe pains—worse at night—in the shins.

The affected man often complains of much smarting about the anal vent, and asserts that he has “piles.” This smarting is usually caused by an eruption between the buttocks of large flattened masses, of a white or light pink colour, from the surface of which there is a thin and very ill-smelling discharge.

Treatment.—A syphilitic seaman should, in his own interest and that of the rest of the crew, be put on shore as early as possible for professional treatment. Whilst on board he should be fed well, and made to take a bath every day. Smoking must be prohibited, particularly when the throat and mouth are affected. Iodide of potassium, in doses of from 3 to 5 grains, should be given every four hours. If the eye be inflamed, and the pupil and iris present the appearances described above, a powder composed of 1 grain of calomel, 2 grains of quinine, and 5 grains of Dover's powder may be given three times a day, and if there should, by chance, be any belladonna ointment on board, this should be smeared over the skin just above the eyebrows, morning and night. The precautions to be taken whilst giving mercury (Chapter xxx.) must be strictly observed, and the use of the powder must be discontinued as soon as the eye becomes clear, or if the gums should become painful and swollen. For sore throat and ulcerated tongue, a gargle of Condyl's fluid or of chlorate of potash (Prescriptions No. 7, 8) will be found useful. Deep sores at the corners of the mouth should be lightly touched with lunar caustic or bluestone, and afterwards covered by a small piece of cotton wool. Sores and ulcerated patches between the buttocks and around the anal vent should be kept as dry as is possible, and frequently "dusted" with fine flour or starch powder.

Tertiary Syphilis.—Secondary syphilis is often followed by a distinct set of affections—an aftercrop, as it were, from the original infection—which may recur very frequently and cause much trouble. Indeed this is by far the most serious form of syphilis, as no organ or structure of the body is exempt from its attack, and it may lead to disease of the brain, the spinal marrow, the liver, and other internal parts. It does not always follow an attack of secondary symptoms, in fact most of those who have suffered from these symptoms seem to escape it altogether, but it is often delayed for many months or even years when one or more of its characteristic affections may be excited by bodily weakness due to some other disease—to "drinking," or to the effects of a hot climate. When several parts of the body are affected at the same time, even though these parts may not be of vital importance, tertiary syphilis becomes a very serious disease, as it has a great tendency to the formation of abscesses and ulcers, the constant and profuse discharge from which causes much exhaustion. The patient, in cases of this kind, becomes pale, thin, and very weak. The following are some of the most manifest and characteristic affections caused by tertiary syphilis:—

Symptoms.—A widely diffused skin eruption presenting hard elevated crusts of a sooty colour, and resembling in form small shells. These crusts when detached leave round and deep ulcers.

Ulcers in different parts of the body: most frequent in legs and arms. Each ulcer seems as if made up of several small ulcers, and whilst it is spreading at one part it shows signs of healing at others. The surrounding skin is usually of a light red or pink colour.

Thickening of a portion of a bone forming a hard and painful swelling from which there is in some instances a discharge of matter. These swellings occur most frequently on the shin, the collar bone, and the front and top of the skull.

Deep and foul ulcers of the throat, the back part of the palate, and the tongue.

A very frequently observed sign of tertiary syphilis is a painless enlargement of both testicles, one testicle being larger than the other.

Treatment.—In dealing with a case in which two or more of the above affections exist together on the same man, it is important to be able to make out whether there has or has not been any previous attack of syphilitic disease. If, notwithstanding the great difficulties that often occur in gaining such information from a seaman, there be good grounds for assuming that such a taint exists, the case should at once be treated by giving iodide of potassium, beginning with 5-grain doses, and gradually increasing the dose to 10 or even 15 grains.* The medicine should be given every three or four hours, and, at the same time, the man's strength should be supported and improved by a generous diet. By such treatment, and by such alone, may the patient be not only relieved of present suffering, but be also guarded against more serious and fatal disorder. As soon as the ship reaches port the man should at once be sent on shore for hospital treatment.

* For precautions to be taken in giving this drug see Chapter xxx.



CHAPTER XXVIII.

SKIN ERUPTIONS.

PRICKLY HEAT—ITCH—DHOBBIE ITCH—SHINGLES—BOILS—LICE.

Prickly Heat.—This painful rash attacks chiefly those who have just passed from a cool to a hot climate, and is the result in most instances of free sweating. It comes on suddenly, and soon subsides, unless it be irritated by continuous sweating and the friction of dirty clothes, and unless the patient takes less animal food and fluids.

Symptoms.—It consists of crops of minute hard pimples, which are most abundant as a rule between the shoulders, on the forehead, on the backs of the wrist and forearms, and over the front of the chest. The chief trouble in connection with this rash is the intense itching it causes.

Treatment.—The patient should take as little fluid as possible in order to avoid sweating, and endeavour to adapt his whole diet to the altered climate. He should frequently wash himself with fresh water, and endeavour to keep his skin dry and clean. Where the eruption is irritated by sweat and hairs, the skin may be freely powdered by a powder of oxide of zinc, chalk, and starch (see Prescription No. 9), or if these cannot be obtained, by flour or powdered starch. The itching may be relieved by sponging the rash with a solution of carbolic acid (2 drams to half a pint of wash or distilled water).

Itch (*Scabies*).—A catching skin disease, caused by a small animal parasite, which burrows beneath the skin.

Symptoms.—The rash consists of minute blebs and red pimples, which are very irritable, especially when the patient is warm in bed. There is usually much scratching, so that the affected skin is marked by the patient's nails.

The parts most frequently attacked are the sides of the fingers, the wrists and elbows in front, and the lower part of the belly. *The face and head are very rarely if ever affected.*

Treatment.—The patient should take a warm bath at night, and, after drying himself thoroughly, rub in sulphur ointment over every part of the body except the head and face. He should sleep between blankets, and in the morning remove the ointment by a second warm bath. This treatment should be

repeated for three nights, or until the itching has ceased. In the meantime his clothing must be either fumigated by sulphur, or cleansed by immersion in boiling water.

Dhobie Itch.—This, which is very common in hot countries, differs from ordinary itch in being caused by a minute vegetable parasite. It is really ringworm rendered more active and irritating by heat and sweating.

Symptoms.—It is usually met with in the groins and fork, and on the armpits, but may occur on any part of the body, though, unlike the ringworm of temperate countries, it seldom if ever attacks the head. It causes much itching in hot and damp weather, and then the skin becomes red and inflamed, in consequence of scratching and the rubbing of wet clothes.

Treatment.—The inflammation should first be removed by dusting the irritated skin with flour, starch powder, or a powder made up of boracic acid, chalk, and starch (see Prescription No. 10). After the irritated parts have been soothed, and the redness of the skin has subsided, tincture of iodine may be applied to the scurfy patch with a small brush, or sulphur ointment be rubbed in every evening. A favourite and useful remedy is Goa powder, mixed with a little lime juice, vinegar, or brandy.

Shingles.—This skin affection, known also as the *tetter*, consists of bright red patches covered by clusters of small watery blebs which in the course of three or four days become yellow, and finally, after the "matter" has been discharged, dry up into thick and loose scabs.

Symptoms.—The rash is often accompanied by severe pain, which may persist after the scabs have fallen off and the skin has become pale and healthy. Shingles usually affects one side of the body, and is most frequently met with on the chest, reaching from the backbone to the front of the breast, but never extending to the opposite side. It may occur along the outside of one arm or leg, or over the eyebrow.

Treatment.—As shingles runs a certain course and does not interfere with the general health, the only treatment that is needed is to protect the inflamed and painful skin by dusting it over with flour or starch powder, and by applying over the affected region a thick layer of cotton wool. If there be much pain during or after the eruption, quinine should be given in doses of from 5 to 8 grains.

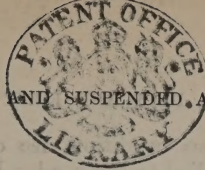
Boils occur frequently on the arms, legs, and feet of seamen, and are caused in most instances partly by a poor diet and partly by the irritating action of sea water. The so-called "salt water boils" are very red and "angry," and cause much pain.

Symptoms.—A boil is an inflamed and tender swelling which begins as a small pimple and gradually increases to about the size of a pea. When produced in clusters by sea water and irritated by the rubbing of wet clothes, some of the boils become much larger and the surrounding skin is inflamed. As the boil increases in size it breaks down at its centre and discharges a small quantity of thin "matter" and a soft white "core."

Treatment.—Boils, unless they be numerous and much inflamed, need no treatment beyond the application of a piece of linen smeared with vaseline or lard, and occasional sponging with hot water. Cases of salt water boils should be treated by rest and poulticing (linseed meal), and, when the boils have burst, by the application of basilicon ointment. If a man be troubled by repeated crops of boils over different parts of the body, he should take quinine (3 grains) every four hours, or, if it can be obtained, a teaspoonful of yeast three or four times in the day.

Lice.—These parasites, which abound in the clothing and on the skin of dirty and careless men, cause a troublesome and itching rash, which will persist as long as the lice and their eggs (nits) are allowed to remain. They are usually scattered over the parts of the body that are covered by clothing, but are sometimes confined to the head. The groins and armpits are very frequently infested.

Treatment.—Body lice may be removed by warm baths, by thorough scrubbing of the skin with soft soap and hot water, and by destroying the clothing, or, if this cannot be spared, by placing it for about ten minutes in boiling water. Head lice are very difficult to get rid of. The hair should be cut very close and the scalp carefully washed with a solution of carbolic acid (four teaspoonfuls in one pint of water), and then well cleansed with soft soap and warm water. If this fails, the short hair should be carefully sponged with turpentine or a petroleum and sweet oil. In obstinate cases of lice in the head or private parts, the application of white precipitate ointment, after removal of the hair, will be found useful.



CHAPTER XXIX.

INSENSIBILITY AND SUSPENDED ANIMATION.

Insensibility from Injury:—SHOCK—CONCUSSION. From Disease:—APOPLEXY—EPILEPSY—ADVANCED KIDNEY DISEASE. From Fainting. From Poisoning. From Drowning. From Hanging. From Choking. From Suffocation by Noxious Gases. From Heat-stroke. From Cold.

INSENSIBILITY may be caused by (a) injury, (b) disease, (c) poisoning, (d) fatigue and fasting, (e) drowning, (f) suffocation, (g) exposure to excessive heat and cold.

FROM INJURY.

Shock.—A severe injury to any part of the body, or even an apparently slight injury in a weak or nervous person, may be followed by *shock* or *collapse*. In this condition there is much prostration and mental depression, often followed by loss of consciousness. The face and the surface of the body become pale and cold, and the pulse is very slow and feeble, so as hardly to be felt. If these symptoms do not pass off in the course of two or three hours, and the patient gradually gets worse and at the same time very restless, internal bleeding may be suspected.

Treatment.—The patient should be laid on his back and kept warm by thick coverings and hot-water bottles. If he be quite unconscious, *nothing should be given by the mouth*. If the symptoms persist and cause anxiety, half a pint of strong coffee, with a wineglassful of brandy, may be injected into the lower bowel by an enema syringe. When recovering, and able to swallow, he should be supplied with some brandy or whisky in cold water.

Concussion and Compression.—After injury to the head, insensibility may result from *concussion* or *stunning*, or from *compression* of the brain (see p. 158). In *concussion* the patient, when spoken to and gently shaken, will take some notice, and the pupils of the eyes are small or contracted. In *compression* the insensibility is much deeper, and the patient cannot be roused. In this latter condition both pupils are usually enlarged, or one may be large and the other small. The breathing in compression is noisy and “snoring.”

Treatment.—In *concussion* there is very little to do beyond keeping the patient quiet and warm. In *compression*, which is

a much more serious condition, ice or cloths dipped in cold water should be applied to the head. In neither of these forms of insensibility should any attempt be made to give the patient stimulants (see p. 159).

FROM DISEASE.

Apoplexy.—If a man over fifty, who has not received any injury or taken any poison, be found insensible in his bunk, or fall down suddenly when at work, and present in either case symptoms similar to those of compression, he has probably had a *stroke* or a fit of *apoplexy*. The breathing is usually noisy, the face flushed, and the mouth drawn to one side. If the man regain consciousness the arm and leg on one side may be found useless and inactive (*paralysis*). If this loss of power be observed in the right side of the body the patient, should he come round, will very probably find difficulty in speaking and making known his wishes.

Treatment.—The patient should be laid on his back, the head being raised, in a quiet and darkened place. Cold (ice or cold water) should be applied to the head, and warmth (hot flannels or a hot water bottle) to the feet. The neck and chest must be relieved of any tight clothing. No fluid or nourishment of any kind should be given by the mouth whilst the man remains unconscious.

In **Epilepsy** (*fits, falling sickness*) the patient is insensible during the stage of convulsions or struggling, and afterwards remains for some time in a heavy sleep.

Treatment.—While the fits last—the face being twisted from time to time, the mouth “frothing,” and the body and limbs violently moved (convulsed) in all directions—the patient should be laid on a mattress or some soft resting-place, and be simply prevented from injuring himself. If there be any bleeding from the mouth, an attempt should be made to insert a piece of cork or of soft stick between the upper and lower teeth, in order to prevent any further biting of the tongue. When the fits have ceased the patient, if he becomes sleepy, should be allowed to rest undisturbed.

Convulsions resembling those of epilepsy may be due to *advanced kidney disease*. In such a case the man, who it may be found had never before been subject to fits, is pale and weak. His face and feet may be swollen (*dropsy*), and his urine, if any can be obtained, will, when heated in a spoon over a small lamp, be found thick and “milky.”

Treatment.—If the presence of dropsy, pallor, weakness, and

a very small quantity, if not total absence of urine, indicate that an attack of convulsions is caused by blood-poisoning from kidney disease, the patient's condition must be regarded as very serious. No harm, however, can be done by purging him freely by castor oil or Epsom salts, and by keeping him warm by thick coverings and hot-water bottles. A mustard poultice may also be placed over the loins.

Fainting (syncope) is due to failure of the heart's action. As the circulation is thus rendered very torpid, the skin of the face and body turns cold and pale, and the brain being badly supplied with blood, the patient becomes giddy and almost blind, and finally loses consciousness. This condition is apt to occur in those affected with heart disease, or who have suffered from loss of blood or some exhausting disease, or in young or otherwise sound subjects who are emotional or hysterical, the exciting or direct cause being an injury, some sudden alarm, exposure to extreme heat, or weakness from over exertion or fasting.

Treatment.—The patient should be laid on his back, with the shoulders raised, so that the head may be a little below the level of the body. Cold water should be sprinkled on the face and chest, and the body exposed freely to the open air or to a fresh draught. As consciousness returns, some brandy and cold water or aromatic spirits of ammonia (1 teaspoonful to a wine-glassful of water) may be given. If a person suddenly becomes faint whilst sitting, he may be brought round at once by bending the head down to his knees, and keeping it in this position for about two minutes, and by exposing him at the same time to a draught of fresh air.

FROM POISONING.

Insensibility is caused by narcotic poisons, such as opium, morphia, and alcohol (see Chapter xxx.).

When a man is deeply intoxicated by alcohol, or "dead drunk," he lies motionless and helpless, and can be roused for only a few seconds, speedily relapsing into a deep stupor. The face in some cases is red and bloated, but in others of a more serious nature, pale or livid. The pupils of the eyes are usually enlarged and the two equal in size. The heat of the body—this is an important point—is below 98°, the natural standard.

Treatment.—Caution must be exercised in dealing with a person supposed to be only "drunk." He may, whilst under the influence of liquor, have injured his head or been attacked by a stroke of apoplexy, and his state of insensibility may be

due rather to injury or disease than to alcohol. In such cases, neglect on the one hand, or a too vigorous treatment by emetics, cold douching, &c., on the other hand, would do harm, and probably lead to very serious results. If the insensible man, when he is gently flapped on the face and chest, comes round for a short time, replies when spoken to, and can move all his limbs freely, an emetic of mustard or salt and water may be given. Should there, however, be any doubt on these points, and should the insensibility be deep and persistent, it would be better to be sure of doing no harm than to make a doubtful attempt to do good; and to content oneself with keeping the patient at rest, under thick coverings, in a quiet place, and watching him. Although it would be well if the patient could get rid of his poisonous dose of alcohol, it is an excellent rule, and one that should always be observed, that an emetic ought not to be given unless there be a certainty that the insensible patient is suffering from the effects of alcoholic intoxication pure and simple. As in a difficulty of this kind the vessel would probably be in port, a doctor should at once be summoned.

Drowning.—Death from submersion in water is caused, in most instances, by suffocation, all the blood in the body becoming black and poisonous, in consequence of the supply of air to the lungs being cut off (*asphyxia*). In some cases, however, death may be due to other causes: the action of the heart may be suddenly arrested by fright, the drowned person may, either before or after striking the water, have received a fatal injury from contact with some hard body, or sudden and intense shock may be produced by immersion in very cold water. The prospects of recovery, after apparent drowning, will depend on the circumstances under which the patient was rendered lifeless and insensible. If he struggled violently and for some time before complete submersion, the consequent muscular exhaustion and, probably, more or less shock due to prolonged chilling, will have seriously reduced the force of his vital resistance to the bad effects of suffocation. If fainting or syncope occurred just as he fell into the water, the chances of restoration to life will be less unfavourable, as the lungs probably contained a good supply of air at this moment, and the entrance of water into the chest would be prevented by spasmodic closure of the upper end of the windpipe.

The question, "how long may a human being remain under water and yet recover," is unsettled. In most instances of drowning—those in which a strong and healthy person finally sinks after struggling—life is quite extinct after two minutes

of complete submersion. The officers of the Royal Humane Society allow a longer interval than this, and state that most generally persons are not recoverable who have been more than four or five minutes under water. There are, however, well-attested cases of recovery after ten and twelve minutes, and even half an hour (*Erichsen*), which should encourage attempts at restoration under the most uncompromising conditions.

Treatment.—The following directions for the restoration of the apparently dead and drowned, founded on those of Marshall Hall, combined with those of Sylvester, have been circulated by the Royal National Lifeboat Institution, and are in use in Her Majesty's ships, and in the lighthouses and vessels of the Corporation of the Trinity House:—

I.—Send immediately for medical assistance, blankets, and dry clothing, but proceed to treat the patient *instantly* on the spot, in the open air, with the face downward, whether on shore or afloat; exposing the face, neck, and chest to the wind, except in severe weather, and removing all tight clothing from the neck and chest, especially the braces.

The points to be aimed at are—first, and *immediately*, the RESTORATION OF BREATHING; and secondly, after breathing is restored, the PROMOTION OF WARMTH AND CIRCULATION.

The efforts to *restore breathing* must be commenced immediately and energetically, and persevered in for one or two hours, or until a medical man has pronounced that life is extinct. Efforts to promote *warmth* and *circulation*, beyond removing the wet clothes and drying the skin, must not be made until the first appearance of natural breathing; for if circulation of the blood be induced before breathing has recommenced, the restoration to life will be endangered.

II.—**To Restore Breathing.**—*To Clear the Throat.*—Place the patient on the floor or ground with the face downwards, and one of the arms under the forehead, in which position all fluids will more readily escape by the mouth, and the tongue itself will fall forward, leaving the entrance into the windpipe free. Assist this operation by wiping and cleansing the mouth.

If satisfactory breathing commences, use the treatment described below to promote warmth. If there be only slight breathing—or no breathing—or if the breathing fails, then—

To Excite Breathing.—Turn the patient well and instantly on the side, supporting the head, and excite the nostrils with snuff, hartshorn, and smelling salts, or tickle the throat with a feather, &c., if they are at hand. Rub the chest and face warm, and dash cold water, or cold and hot water alternately, on them. If there be no success, lose not a moment, but instantly—

To Imitate Breathing—Replace the patient on the face, raising and supporting the chest well on a folded coat or other soft article.*

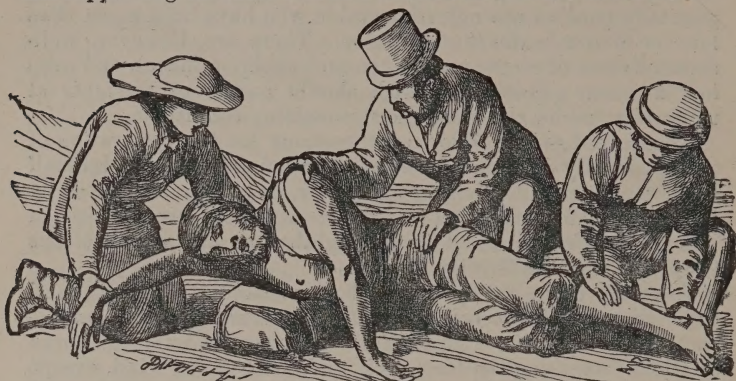


Fig. 55.—Restoration of Apparently Drowned. 1. Inspiration
(Marshall Hall's Method).

Turn the body very gently on the side and a little beyond, and then briskly on the face, back again, repeating these measures

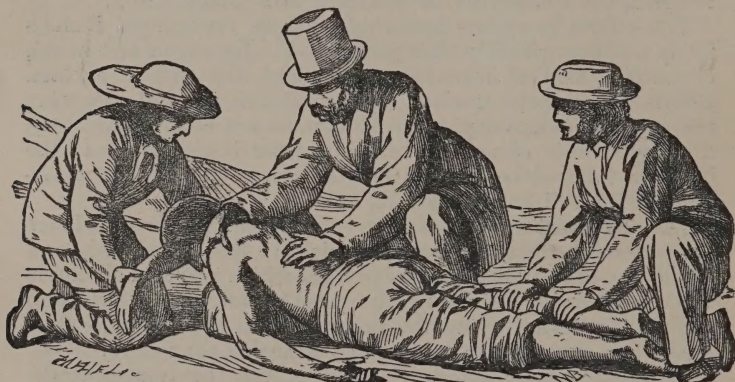


Fig. 56.—Restoration of Apparently drowned. 2. Expiration
(Marshall Hall's Method).

cautiously, efficiently, and perseveringly, about fifteen times in the minute, or once every four or five seconds, occasionally

* Of the two methods of imitating breathing (Marshall Hall's and Sylvester's), the latter, the author believes, is preferable, and should be always tried in the first instance (see following page).

varying the side. (By placing the patient on the chest, the weight of the body forces the air out; when turned on the side, this pressure is removed, and air enters the chest.)

On each occasion that the body is replaced on the face, make uniform but efficient pressure with brisk movement on the back between and below the shoulder-blades or bones on each side, removing the pressure immediately before turning the body on the side.

During the whole of the operations let one person attend solely to the movements of the head and of the arm placed under it.

The first measure increases the expiration; the second commences inspiration. The result is respiration or natural breathing, and if not too late, life.

Whilst the above operations are being proceeded with, dry the hands and feet, and as soon as dry clothing or blankets can be procured, strip the body, and cover or gradually reclothe it, but take care not to interfere with the efforts to restore breathing.

III.—Should these efforts not prove successful in the course of from two to five minutes, proceed to imitate breathing by Dr. Sylvester's method, as follows:—

Place the patient on the back on a flat surface, inclined a little upwards from the feet; raise and support the head and shoulders on a small firm cushion or folded article of dress placed under the shoulder-blades.

Draw forward the patient's tongue, and keep it projecting beyond the lips: an elastic band over the tongue and under the chin will answer this purpose, or a piece of string or tape may be tied round them, or by raising the lower jaw, the teeth may be made to retain the tongue in that position. Remove all tight clothing from about the neck and chest, especially the braces.

To Imitate the Movements of Breathing.—Standing at the patient's head, grasp the arms just above the elbows, and draw the arms gently and steadily upwards above the head, and *keep them stretched* upwards for two seconds. (*By this means air is drawn into the lungs.*) Then turn down the patient's arms, and press them gently and firmly for two seconds against the sides of the chest. (*By this means air is pressed out of the lungs.*)

Repeat these measures alternately, deliberately, and perseveringly, about fifteen times in a minute, until a spontaneous effort to respire is perceived, immediately upon which cease to imitate the movements of breathing, and proceed to induce circulation and warmth.

IV.—Treatment after Natural Breathing has been Re-

stored.—*To Promote Warmth and Circulation.*—Commence rubbing the limbs upwards, with firm grasping pressure and

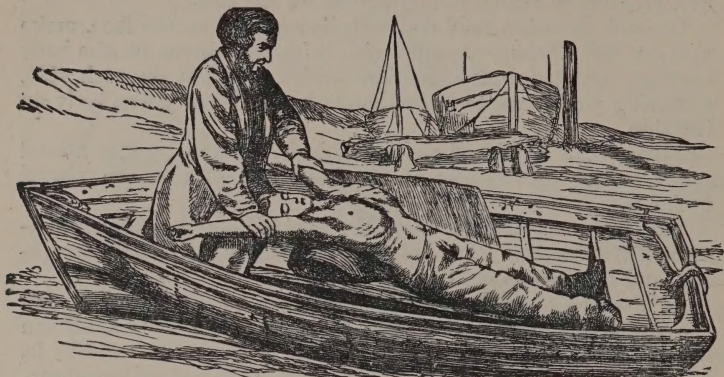


Fig. 57.—Restoration of Apparently Drowned. 1. Inspiration
(Sylvester's Method).

energy, using handkerchiefs, flannels, &c. (*By this measure the blood is propelled along the veins towards the heart.*)

The friction must be continued under the blanket or over the dry clothing.



Fig. 58.—Restoration of Apparently Drowned. 2. Expiration
(Sylvester's Method).

Promote the warmth of the body by the application of hot flannels, bottles, or bladders of hot water, heated bricks, &c., to

the pit of the stomach, the armpits, between the thighs, and to the soles of the feet.

If the patient has been carried to a house after respiration has been restored, be careful to let the air play freely about the room.

On the restoration of life, a teaspoonful of warm water should be given; and then, if the power of swallowing have returned, small quantities of wine, warm brandy-and-water, or coffee should be administered. The patient should be kept in bed, and a disposition to sleep encouraged.

General Observations.—The above treatment should be persevered in for some hours, as it is an erroneous opinion that persons are irrecoverable because life does not soon make its appearance, persons having been restored after persevering for many hours.

Appearances which generally accompany Death.—Breathing and the heart's action cease entirely; the eyelids are generally half closed; the pupils dilated; the tongue approaches to the under edges of the lips, and these, as well as the nostrils, are covered with a frothy mucus. Coldness and pallor of surface increase.

Cautions.—Prevent unnecessary crowding of persons round the body, especially if in an apartment.

Avoid rough usage, and do not allow the body to remain on the back unless the tongue is secured.

Under no circumstances hold the body up by the feet.

On no account place the body in a warm bath unless under medical direction, and even then it should only be employed as a momentary excitant.

HANGING.

The suspended body should be *first* lifted up with one arm and afterwards quickly cut down.

Treatment.—The neck and chest should then be set free by loosening the nooze and removing necktie, collar, braces, &c. If free exposure to fresh air and the pouring of cold water over the face and chest fail to bring the patient round, Sylvester's method of artificial respiration (see p. 247) should be practised without delay.

CHOKING.

Violent squeezing of the throat, or a violent blow over the windpipe, may cause symptoms of suffocation, the injured person becoming blue in the face and struggling for breath.

Treatment.—These symptoms will, in most instances, soon

pass away if he be laid on his back with the head and shoulders raised, and be freely exposed to fresh air. If the difficulty in breathing increase, artificial respiration (Sylvester's method, see p. 247) should be tried.

Both windpipe and gullet may be obstructed by a mass of solid food too large to be swallowed. If the man be seen at once the symptoms of suffocation may be promptly relieved by passing the finger into the throat and "hooking out" the obstructing body.

A portion of food or a small foreign body—a coin, cherry stone, a fragment of bone—may "go the wrong way" and pass into the windpipe. This accident is usually followed by alarming symptoms of suffocation, which may cause immediate death or cease for a time, to be followed at varying intervals by similar attacks, and finally by fatal inflammation of the lungs.

Treatment.—In a case of this kind the back of the mouth and the throat should be carefully explored, by the finger passed well back beyond the tongue, as the obstructing body may have been caught at the entrance to the windpipe, whence it could probably be removed without much difficulty. If the examination prove fruitless, and the patient is still struggling for breath, he should be taken up by the heels and held with his head downwards for a few seconds, the back being slapped whilst he is in this position. If the attack of suffocation should pass off, he must be kept at rest on his back until he can be submitted to professional treatment.

SUFFOCATION BY NOXIOUS GASES.

Serious and, it may be, fatal symptoms are produced when the inspired air is contaminated by some noxious gas, as charcoal vapour (carbonic oxide), sewer gas, coal gas, and carbonic acid gas (carbon dioxide).

Poisoning from the last mentioned gas occurs where a number of persons are crowded together in a small and badly ventilated space. In the calamity which occurred on the steam-ship "Londonderry" in 1848, of 200 passengers who were confined during stormy weather in a cabin 18 feet long, 11 feet wide, and 7 feet high, which was covered by a tarpaulin, nearly one half died from breathing again and again the same air. Whenever a free supply of fresh air is shut off from any space occupied by human beings, the air of that space is poisoned by a gradual accumulation of carbonic acid which when inhaled in small quantities day after day seriously impairs health and vigour, and when present in large quantity rapidly causes death by suffocation or asphyxia.

The symptoms of acute poisoning by carbonic acid (carbon dioxide) are giddiness, headache, difficulty in breathing, slow and feeble pulse, a dusky and bluish colour of the face, and insensibility.

Treatment.—In rescuing a person poisoned by carbonic acid or any other noxious gas, endeavour should first be made to let in fresh air by opening or, if necessary, by forcing in the doors and windows. Should this be impossible without wasting time the rescuer should cover his mouth and nose with a cloth soaked in water, or equal parts of vinegar and water, then take a deep breath at the door of the room, rush to the nearest port-hole or window, and open it or break the glass, put his head through the aperture, take in fresh breath, rush to the next opening, and so on till the thorough draught has dispersed the poisonous vapour, and the unconscious person can be removed. When this has been done attempts should be promptly made to restore animation by exposing the patient freely to fresh air, by pouring cold water over his face and exposed chest, and, if these fail, by practising Sylvester's method of artificial respiration (see p. 247).

HEATSTROKE (SUNSTROKE, INSOLATION, HEAT APOPLEXY, THERMIC FEVER).

Exposure to intense solar or artificial heat may cause insensibility in more ways than one.

Many cases of supposed sunstroke, particularly those occurring in a temperate climate, are really cases of exhaustion due to fatigue and heat combined, and, in many instances also, to tight clothing.

In a tropical climate inflammation of the membranes of the brain and spinal cord may, it is believed, be caused by direct exposure of the head and of the back of the neck to the direct rays of the sun. Cases of this kind are probably very exceptional.

The most serious result of exposure to excessive heat is a condition of very high fever, with insensibility, and "hard" and gasping breathing. For this condition the names of thermic or heat fever and heat apoplexy are more appropriate than that of sunstroke, as the attack may come on in a sheltered place, and occurs as frequently at night as in the day. Men working on deck are rarely attacked at sea, but this form of heatstroke often occurs amongst stokers and firemen.

Symptoms.—There is an important distinction between this thermic or heat fever and the sunstroke due to exhaustion.

In the former the skin is very hot and dry, and the heat of the body, if tested by a clinical thermometer, will be found raised far above the natural point of 98° (to 108°, 110°, or even higher).* In the latter the skin is cool and the face pale.

An attack of heat fever often begins with thirst, restlessness, and general depression. A frequent desire to pass urine is a most important early symptom, which is too often neglected.† The face becomes at first red and swollen, and afterwards dusky and livid, and the eyes are blood-shot. The breathing is difficult and hurried, and the pulse quick and full. The patient for a time is very restless, and in some instances delirious, and then passes into a state of insensibility and complete collapse. In severe cases convulsions occur. If these alarming symptoms pass off, there will be still much cause for anxiety. An apparent recovery may be followed by sudden and fatal relapse, and in many instances the man will be incapacitated for work for the rest of his life by symptoms of brain disease, and weakened intellect.

Treatment.—In cases of simple exhaustion, in which the skin is cold and pale, and the patient is in a faint, removal to a cool and airy place, sponging of the face and chest, and the administration of some brandy or whisky and water will suffice to bring about recovery. The patient should, of course, be laid on his back, and all tight clothing about the neck and chest be loosened.

In a case of heat fever in which the skin is very hot, and the face and eyes are much flushed, the patient should be carried at once to a cool and shady place, and be well doused with cold water. A gentle stream from the hose may be played on the head and front of the chest and belly. *This should be discontinued as soon as the skin becomes cool, or if the patient be convulsed.* He should be allowed to rest under shelter, but in a cool place, and be lightly covered. Ice or cold water should be applied to the head, and an attempt made to relieve the bowels by giving one or more large doses of Epsom salts (half an ounce to an ounce of warm water). For at least a week after his attack, the patient should be kept at rest and on low diet, and if he remains feverish, be treated by quinine (5 grains of the powder every four hours). He should not be allowed to take

* Hence the necessity of including a clinical thermometer in the official List of Medical Stores. Mr. Cato holds that a description of the use of this instrument would be necessarily included in that of conditions such as sunstroke and dysentery.—Shipmaster's Society, Course of Papers, No. 36.

† Surgeon-Major Parke, *Guide to Health in Africa*, p. 91.

to his work again, or even to move about on deck, until he has been seen by a medical man. It may be found necessary to advise his removal to a cool climate.

EFFECTS OF EXTREME COLD (CONGELATION).

The action of extreme cold, as has been proved by the records of Arctic explorers, can be well tolerated by a man who is strong and healthy, well fed, and warmly clothed. On the other hand, he will suffer severely if enfeebled by ill-health, intemperate habits, poor diet, and fatigue. The young and the aged are more susceptible to cold than in the prime of life. The grave effects of exposure to cold depend not so much on its intensity as on certain associated conditions, such as wind and wet. A man may live in a still dry air, even though the temperature be very low, who would be speedily overcome by less cold, if exposed at the same time to high wind and to snow, sleet, and sea water. A cool draught, as is well known, speedily chills the body, and immersion in water takes away more heat from the body than air of the same temperature (*Durham*). The duration of exposure is an important factor, as a brief action of excessive and severe cold will be less injurious than the prolonged and continuous action of a temperature of less intensity. As a rule, cold is more severe, and is felt more bitterly at night than in the day.

Sudden exposure to extreme cold, as in immersion in very cold water, may cause immediate death, the muscles of the body becoming rigid, and the man dying from asphyxia. The usual results of exposure to cold are:—General discomfort, followed by prostration, loss of muscular power and of control over the movements of the limbs, chilliness of the body and shivering, duskiess and afterwards pallor of the face, coldness of the skin over the whole body, intense thirst, faintness, mental confusion, muttering and delirium, increasing drowsiness, and, finally, in the worst cases, complete collapse and insensibility, and a painless death. In some instances the patient is convulsed. The irresistible craving for rest and sleep so often spoken of is not a constant sign, and, when it does occur, is probably due as much to fatigue from prolonged and violent muscular exertion as to the effects of cold.

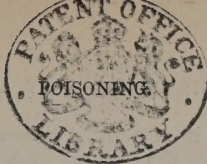
In the treatment of congelation the chief object is evidently to restore the heat of the chilled body. This, however, as in cases of frost bite, must be done *gradually* and not *at once*. The plan of putting the patient in a bath of cold water, and then

adding, little by little, hot water, until after a time the temperature of the bath is raised to about 90°, though impracticable in most instances, and in extreme chilling not free from risk, would indicate the line of treatment to be carried out. The patient should be stripped, laid on his bunk, or on the deck of a covered and protected space, and covered by rugs or blankets. The surface of the body and limbs should then be gently rubbed by the hands of two or more helpers, the skin being moistened at first by cold, and afterwards tepid and hot, water, the heat being gradually increased. This rubbing should be carried on continuously and doggedly for at least half an hour, even though the patient may be apparently lifeless. *If able to swallow* he should take at first some hot coffee or tea, and when he has come round a "stiff" glass of whisky or brandy with hot water. After animation has been restored, and heat restored to the skin, the patient should remain on his back, and be kept warm by hot-water bottles to the feet and on each side of the body, and also by a mustard poultice over the stomach. In most severe cases of severe chilling it will be necessary to watch the man carefully for the first twenty-four hours lest any relapse should occur, and afterwards for some days to restore his strength by a nourishing fluid diet (soup and beef tea), and brandy, port wine, or stout.

Precautions.—In passing suddenly from a warm to a very cold climate some attention should be paid both to the clothing and the diet of the men. They should then take as much meat as can be supplied, together with abundance of fat or grease. Hot coffee should be given freely, and spirits (whisky with hot water) be allowed at night. Alcohol, though it will not protect the men against the direct action of cold, may serve to supplement what, under the circumstances, may be found a somewhat defective diet, and also to prevent mental depression.

A sudden change from hot to cold weather or prolonged exposure of a crew to extreme cold and wet are likely to act injuriously not only by setting up affections, such as bronchial catarrh, bronchitis, and rheumatism, but also by reducing the vigour of the men and their resistance to the depressing effects of a hard life and a monotonous diet. Thus, in a prolonged voyage of a badly provisioned ship from the East Indies, scurvy might suddenly show itself at the first approach of bad weather.

For the local effects of cold, see *Frost-Bite*, p. 111.



CHAPTER XXX.

POISONING.*

Classes of Poisoning. Special Directions in cases of Poisoning:—
ALCOHOL—AMMONIA—AQUA FORTIS—ARSENIC—BLUE VITRIOL—
BURNETT'S FLUID—CARBOLIC ACID—CHLORAL—CHLOROFORM—
COPPER—CORROSIVE SUBLIMATE—IODINE—LUNAR CAUSTIC—
MORPHIA—OPIUM—OXALIC ACID—PHOSPHORUS—PRUSSIC ACID—
STRYCHNINE—TOBACCO—VITRIOL—POISONOUS FOODS. Hurtful
Effects of Certain Drugs:—COPAIBA—CARBOLIC ACID—IODIDE
OF POTASSIUM—MERCURY—NITRATE OF POTASH—QUININE—TINC-
TURE OF STEEL.

IN the absence of positive information, there are good grounds for suspecting that a poison has been taken (1) if severe and alarming symptoms suddenly attack a person in perfect health; (2) if these symptoms come on very soon after a meal, a drink, or a dose of medicine; or (3) if of several persons who have shared in the same meal or drink, all or many are suddenly affected with like symptoms.

Some poisons when swallowed attack directly, and burn into the structures with which they come in contact, particularly those of the mouth, gullet, and stomach. These poisons, which are called *corrosives*, include strong acids, as aqua fortis, oil of vitriol, spirits of salt, oxalic acid, carbolic acid.

There are other poisons which do not burn and destroy tissues at once, but after an interval irritate and inflame them. These are called *irritant* poisons, and include blue stone, lead, phosphorus, and tainted meat.

A third class of poisons, called *neurotics*, act on the nervous system, and cause headache, deep sleep, palsy, convulsions, &c. This class is represented by opium, chloral, prussic acid, alcohol.

Some poisons (strychnine, aconite, poisonous mushrooms) act both as irritants and neurotics.

* Although a disaster of this kind rarely occurs on board ship, it is thought advisable to give directions as to the ready treatment of poisoning by articles in frequent use (for cleansing, disinfection, the destruction of vermin, &c.), and also by the poisonous agents—most of them used for external application—given in the Scale of Medicines. To anyone who may have for a long period to be responsible in the absence of medical help for the health of a body of men, the author would recommend Dr. Murrell's useful little book on *What to do in Cases of Poisoning*.

Treatment.—In the treatment of a case of poisoning, the chief aims are : (1) to enable the patient to get rid of the poison ; (2) to counteract the effects of the poison by an antidote ; (3) to support the patient's strength and to keep him alive during the action of the poison ; (4) to relieve pain.

To remove the poison from the system it is necessary to excite vomiting by giving an emetic. It should be borne in mind, however, as a most important point, that *an emetic should never be given in a case of poisoning by a corrosive.*

In poisoning by an irritant or a neurotic, an emetic should be given at once. The most useful emetics are mustard, common salt (1 tablespoonful of either to a tumblerful of water), white vitriol ($\frac{1}{2}$ to 1 teaspoonful in a wineglassful of water), and ipecacuanha (1 to 2 teaspoonfuls in a wineglassful of water). Whilst the emetic is being prepared an attempt should be made to produce vomiting by tickling the patient's throat with the finger or a feather.

In the second place, endeavour should be made to weaken the poison by diluting it with copious draughts of fluid, or to render it inert by giving an antidote.

In poisoning by an acid, as aqua fortis, spirit of salt, or oxalic acid, some alkali (magnesia, carbonate of soda, the plaster scraped from a whitewashed wall, soap and water) should be given. On the other hand, when the poison is an alkaline substance (caustic potash or soda), the most suitable antidote would be an acid fluid such as lime juice, or a weak solution of vinegar.

If the poisoned man become very drowsy under the influence of a narcotic, such as opium, he should be made to exercise his limbs by walking about, or be stimulated by pouring cold water over his head and chest, or by flapping him with wet towels. Extreme faintness or impending collapse should be treated by giving stimulants, such as strong coffee, brandy, or whisky, and applying warmth to the surface by means of heated blankets, hot-water bottles, and mustard poultices.

Pain may be relieved by giving thick soothing drinks (milk, flour or arrowroot and water, olive oil), and by applying over the belly flannels wrung out in hot water and sprinkled over with laudanum.

In every case of suspected poisoning, care should be taken to preserve for medical examination some of the vomit, and any bottle or vessel that may have contained the supposed poison, together with stained clothing.

POISONING.

SPECIAL DIRECTIONS IN CASES OF POISONING.*

1. **Alcohol.**—Any strong spirit, when taken in excess will, within a short time, cause giddiness, reeling, stupor, and, at last, deep insensibility. The face is usually flushed, and the eyes are bloodshot. *There is a strong odour of spirit in the breath.* After apparent recovery from all bad symptoms the man may become insensible again and die suddenly.

There is often much difficulty in distinguishing effects of alcohol from those of other poisons, and of injury and disease of brain (see p. 243).

Treatment.—Expose the neck and chest. Give an emetic of mustard — a tablespoonful in a tumblerful of sea water, or a third of a teaspoonful of white vitriol (sulphate of zinc) in a wineglassful of drinking or distilled water. After the man has vomited, flap the chest and the soles of the feet with wet towels, and endeavour to keep him awake. As he comes round let the hose be played lightly on the head and back.

2. **Almond Flavour.** See *Prussic Acid*, No. 30.

3. **Ammonia.**—The strong solution containing 30 per cent. of ammonia may cause death in a dose of two teaspoonfuls. The weaker solution known as *spirits of hartshorn* contains 10 per cent. of ammonia. The vapour of strong ammonia, if too freely used in cases of fits or fainting, may cause fatal irritation of the lungs and windpipe.

Symptoms.—Sharp burning pain in throat, mouth, and stomach. Lips and tongue inflamed and swollen. Much difficulty in breathing. Eyes bloodshot. Vomiting of pale and stringy fluid mixed with blood. Smell of hartshorn in the breath.

Treatment.—Lime juice given freely, and, afterwards, sweet oil or white of egg in small and frequently repeated doses. The irritation of the windpipe may be relieved by inhaling the steam from boiling water.

4. **Aqua Fortis** (*Nitric Acid*).—A powerful corrosive poison, fatal in quantities of two teaspoonfuls and upwards.

Symptoms.—Intense scalding pain from mouth to stomach. Vomiting of dark brown fluid. Pain in belly and over stomach. Mouth and tongue soft and swollen, and stained yellow. The breathing becomes difficult, and the surface of the body cold. Death from prostration in from fifteen to twenty hours.

Treatment.—Bicarbonate of soda (two tablespoonfuls to a pint

* When ipecacuanha is used as an emetic care must be taken to use the simple and not the compound (Dover's) powder.

of warm water (given frequently). Common washing soda, chalk, whiting, or Dinneford's fluid magnesia will serve as well. Some thick fluid, such as milk, sweet oil, white of egg and water, should also be given if the patient can keep it down. If the pain in the throat and belly be very severe twenty-five drops of laudanum should be given in a wineglassful of water.

5. **Arsenic.**—Fatal dose in an adult from 2 to 3 grains.

Symptoms appear in about half an hour. Faintness, nausea, vomiting of brown and blood-stained fluid, much thirst with dryness and stiffness in the throat, purging with scanty stools, cramps in the legs, stupor, and slight convulsions.

Treatment.—Encourage frequent and copious vomiting by mustard (one tablespoonful to a tumblerful of hot water), or white vitriol (a third of a teaspoonful to a wineglassful of drinking water). Afterwards give thick soothing drinks, such as milk, flour and water, linseed or olive oil, castor oil. If the patient becomes cold and prostrate wrap him in hot flannels, apply hot-water bottles, *each wrapped in a piece of flannel*, and administer brandy or whisky. In extreme cases give sal volatile (1 teaspoonful in a tablespoonful of water) every quarter of an hour, and try artificial respiration (see p. 246).

6. **Battle's Vermin Killer.** See *Strychnine* No. 32.

7. **Bitter Almond Water.** See *Prussic Acid*, No. 30.

8. **Black Drop:** varies in strength, but is stronger than laudanum. See *Opium*, No. 27.

9. **Blue Vitriol** (*Sulphate of Copper*).—Fatal in quantities of half an ounce and upwards.

Symptoms.—A strong metallic taste; violent vomiting of a blue or green fluid, severe headache, pain in belly, vomiting, intense thirst.

Treatment.—Emetic of mustard and warm water (1 tablespoonful to a tumblerful); large draughts of flour and water or barley water; hot flannels or a linseed poultice over belly.

10. **Burnett's Fluid.**—This disinfectant is a strong solution of chloride of zinc.

Symptoms.—Burning of lips, mouth, and throat; almost constant vomiting of thick blood-stained fluid, much pain in stomach, clammy perspiration on surface of the body, muscular weakness. In less acute cases death may occur from exhaustion after an interval of several weeks.

Treatment.—Large quantities of bicarbonate of soda, or failing this, of washing soda dissolved in warm water.

Barley water, or tepid water or milk, should be given freely. To relieve pain give a laudanum draught (30 drops to a wine-

glassful of water), and apply hot flannel sprinkled over with laudanum to the belly.

11. **Butler's Vermin Killer.** See *Strychnine*, No. 32.

12. **Carbolic Acid.**—This is a very active poison, and fatal in small quantities. It acts on the whole system with great rapidity.

Symptoms.—The inside of the mouth is white and swollen. The breath often smells of carbolic acid; intense pain along gullet and in stomach; delirium quickly followed by deep insensibility and collapse. In most cases the urine when passed is of a green or black colour. In fatal cases death occurs rapidly, within four hours.

Treatment.—Give at once half a tablespoonful of Epsom salts in a tumblerful of warm water, and afterwards a tablespoonful of mustard, or half a teaspoonful of white vitriol, in warm water. The patient should take as much oil (sweet, linseed, olive, or castor oil) as he can keep down. Stimulants (brandy, whisky, or strong coffee) should be given freely, and the patient be kept warm by thick blankets and hot-water bottles.

13. **Chloral.**—One teaspoonful of the liquid chloral may cause serious symptoms, and three teaspoonfuls may be fatal.

Symptoms.—Deep sleep passing into insensibility. Slow breathing and a quick and almost imperceptible pulse. Surface of body and limbs cold.

Treatment.—Empty stomach by mustard or white vitriol (a tablespoonful of mustard, and a dram of white vitriol in a wineglassful of warm water): copious draughts should be given of warm water and salt, the patient should be roused and kept warm by active rubbing of the limbs and chest, and by mustard poultices applied over the pit of the stomach and to the calves of the legs. In desperate cases ten drops of tincture of nux vomica or a tabloid of the same drug, if either be available, should be given every hour. Strong coffee should from time to time be slowly injected in small quantities into the lower bowel by an enema syringe. If the breathing become very slow artificial respiration (see p. 246) should be practised and kept up for some time.

14. **Chloroform**, when swallowed, even in a small dose (one teaspoonful), may prove fatal.

Symptoms.—Burning pain in throat and stomach, vomiting, stupor deepening into complete insensibility, with noisy breathing, cold skin, and livid face. Tendency to relapse after rallying or apparent recovery.

Treatment.—The same as that of chloral poisoning: an emetic of

mustard or white vitriol, rubbing of the chest and limbs, injection of strong coffee into lower bowel, mustard poultices to pit of stomach and calves of legs. Copious draughts of bicarbonate of soda or washing soda in warm water should also be given.

15. **Copper.**—Food, particularly fruit and salted and oily substances, may be rendered poisonous by cooking in a copper vessel.

Symptoms.—Coppery taste in mouth, colic, vomiting of greenish fluid, and purging.

Treatment.—Excite vomiting by mustard or large quantities of warm water, and then give some thick and soothing fluid, as gruel, milk, flour and water, or white of egg.

16. **Corrosive Sublimate** (*Perchloride of Mercury*).—An active irritant poison, fatal in small doses (2 to 5 grains). Often used to kill beetles, and may be taken in mistake for calomel. It has a very acrid and “coppery” taste.

Symptoms.—Sharp pain in stomach, vomiting of thick and stringy phlegm, purging, tongue white and dry, lips red and swollen, faintness and stupor.

The symptoms produced by corrosive sublimate, in the first instance, resemble those of cholera; if the individual should survive several days, they are more like those of dysentery—violent straining, and mucous discharges mixed with blood, being very frequently observed.*

Treatment.—Emetic of mustard (one tablespoonful in warm water) or white vitriol (one-third of a teaspoonful), *white of egg and water*, and flour or arrowroot and water.

17. **Essential Oil of Almonds.** See *Prussic Acid*, No. 30.

18. **Essential Salt of Lemons.** See *Oxalic Acid*, No. 28.

19. **Fowler’s Solution** contains arsenic, a little more—one-third of a grain—than 4 grains in 1 ounce. See *Arsenic*, No. 5.

20. **Gibson’s Vermin Killer.** See *Strychnine*, No. 32.

21. **Iodine.**—Death has been caused by 20 grains. Iodine liniment or paint, which contains 51 grains in the ounce, if taken in mistake, will cause a scalding pain in the throat, severe pain in the belly, and vomiting and purging. The vomited fluid will be of a dark blue colour if bread or any other starchy matter has been recently taken.

Treatment.—An emetic of mustard or salt and water. Arrowroot or corn flour mixed with warm water to be given freely.

22. **Laudanum.** See *Opium*, No. 27.

23. **Lunar Caustic** (*Nitrate of Silver*).—A portion of the white stick may be swallowed in mistake, or break off and fall

* Taylor and Stevenson, vol. i., p. 295.

into the gullet whilst being applied to a sore throat. A mixture of common salt and water (2 tablespoonfuls to about half a pint) should be given at once and renewed frequently in small quantities. If this should not cause vomiting give an emetic of mustard—one tablespoonful to a tumblerful of warm water.

24. **Morphia.**—The most active poisonous constituent of opium. Prescribed in the form of hydrochlorate or acetate, both of which act rapidly, and often prove fatal in very small doses. The symptoms closely resemble those of poisoning by opium and the treatment should be the same. See *Opium*, No. 27.

25. **Nitrate of Silver.** See *Lunar Caustic*, No. 23.

26. **Nitric Acid.** See *Aqua Fortis*, No. 4.

27. **Opium.**—Five grains of opium would be a fatal dose to most persons.* *Laudanum* contains nearly 33 grains in 1 fluid ounce; *opodeldoc* 33 grains in 2 ounces; *paregoric* 2 grains in 1 fluid ounce; *opium pill* about 1 grain in 6; *Dover's powder* 1 grain in 10.

Symptoms.—A short stage of mental excitement, followed by drowsiness and, after a time, by complete insensibility, the patient when roused by shaking or by loud noises soon falls again into a heavy sleep, and at length makes no kind of response. The face, flushed at first, becomes livid, the lower jaw falls, and the pupil or central black circle in the eye is reduced to the size of a pin's head. The pulse gradually fails and the breathing becomes noisy.

Opium acts on the system rapidly, usually within the first quarter of an hour. Its action is more prompt when taken on an empty than on a full stomach; when in a liquid state than when swallowed in the solid form; when the patient remains still than when he takes exercise immediately after swallowing the poison; and it is probable that the action is postponed and diminished by spirituous liquors.†

The effects of opium may be mistaken for apoplexy, advanced kidney disease, extreme drunkenness, and poisoning by chloroform (see pp. 242, 243, 259).

Treatment.—An emetic of white vitriol (half a teaspoonful in a cupful of warm water) should be given at once. If this fail salt and warm water should be given in copious draughts, and the throat be tickled with the finger or a feather. Sea water should be poured over the head, face, and chest. It is very important to keep the patient awake by making him walk up

* Taylor and Stevenson, vol. i., p. 377.

† Guy, *Forensic Medicine*.

and down a long space on deck between two assistants. When he is unable to walk the soles of the feet should be vigorously flipped with a wet towel. Should he become cold and collapsed, the stupor rapidly increasing, give a teaspoonful of aromatic spirits of ammonia in a wineglassful of warm water, and strong coffee in small quantities. If all these means fail after long trial, and the patient seems in a desperate condition, give, if available, a tabloid of tincture of belladonna (15 minims) every half-hour.

28. **Oxalic acid** (*Acid of Sugar*).—*Symptoms*.—A very sour taste, burning pain in throat and stomach, vomiting of dark green or black matter, purging.

Treatment.—Chalk should be given at once mixed with water. If this be not at hand the powder obtained by scraping a white-washed wall or ceiling should be used. After the patient has come round a dose of castor oil may be given, but *not* Epsom salts.

29. **Phosphorus**.—This irritant poison is contained in “rat paste.”

Symptoms.—A smell like that of garlic in the breath, pain in and swelling of the belly, vomiting of yellow fluid which also smells like garlic and is said to be luminous in the dark, intense thirst. After apparent recovery the patient may become feeble and suffer from jaundice and kidney disease.

Treatment.—Emetic of salt and water or of white vitriol (one-third of a teaspoonful in water); if blue vitriol be available, give small quantities (3 to 5 grains) in water every hour. After the severe symptoms have passed off, give a dose of Epsom salts or castor oil.

30. **Prussic Acid** (*Hydrocyanic Acid*).—This poison acts almost at once, and is fatal in small doses. Bitter almond water, essential oil of bitter almonds, and almond flavour all contain prussic acid.

Symptoms.—Insensibility, cold and livid skin, pulse and respirations very quick, clenched jaws, convulsions, collapse, foaming at the mouth.

Treatment.—Attempt at once to excite vomiting by tickling the throat, giving salt water, and afterwards, when the emetic is at hand, a tablespoonful of mustard or half a teaspoonful of white vitriol in a cupful of water. Give stimulants freely, and place over the patient's nose and mouth a handkerchief sprinkled with spirits of hartshorn. The chest and face should be douched alternately by hot and cold water. If these plans fail, try artificial respiration (see p. 245).

31. **Rat Poisons.**—*Battle's vermin killer* contains strychnine; *Roth's paste*, phosphorus; *Simpson's paste*, arsenic.

32. **Strychnine** is contained in vermin killers—Butler's, Battle's, Wiggins, Gibson's, and Hunter's.

Symptoms.—Very painful and rigid spasm of the trunk and limbs, the body being jerked, usually backwards, every four or five minutes, or at longer intervals, breathing difficult, the muscles in front of belly very hard, a peculiar change in the features, the face being drawn into a fixed grin, the fits of spasm become more and more frequent, the patient being unable to open the jaws and to swallow.

Treatment.—An emetic of mustard (one tablespoonful) or of white vitriol (half a teaspoonful) in a cupful of warm water. Finely-powdered animal charcoal (bone black, such as is used by painters), if available, may be given freely as an antidote; to relieve the painful spasms bromide of potassium (one teaspoonful) with ten drops of laudanum may be given in a wineglassful of water. Artificial respiration (see p. 245) should be performed if possible. If the patient can be kept alive for two hours after the beginning of the symptoms there will be a fair hope of recovery.*

33. **Sulphate of Copper.** See *Blue Vitriol*, No. 9.

34. **Tobacco.**—In cases of prostration and collapse from excessive chewing of strong tobacco give an emetic of mustard (one tablespoonful to a cupful of water), and after this has caused vomiting, strong tea with brandy; the patient should be kept on his back until the serious symptoms (faintness, weak pulse, coldness of skin) have passed away.

35. **Verdigris.**—Symptoms and treatment similar to those of *Blue Vitriol*, No. 9.

36. **Vitriol** (*Oil of vitriol*, *Sulphuric acid*).—An active corrosive poison.

Symptoms.—Burning pain in mouth, throat, and stomach; incessant retching and vomiting of thick, shreddy, and dark-coloured fluid, painful straining at stool but no purging, collapse, and, in some cases, severe spasms. The tongue is white and shrivelled, and there may be dark brown stains on the hands or chin, and oily and ragged patches of a brown colour on the clothes.

Treatment.—Soap and water, milk, or even drinking water should be given at once. Sweet oil may also be given if the patient can swallow it. If chalk or lime water be not at hand, scrape a white-washed wall and mix the powder with water,

* Guy, *Forensic Medicine*.

whilst one of the above-mentioned is being given. Let the powder be given frequently.

Vitriol Throwing.—Dry the stains on the skin with cotton wool, and then wash them with a strong mixture of common washing soda or bicarbonate of soda and water. If the eyes have suffered syringe them thoroughly with a solution of washing soda (a teaspoonful to a cupful of warm water), and then drop in castor oil.

POISONOUS FOOD.

Many articles of food, especially meat, fish, and cheese, may under certain conditions act as irritant poisons and cause disquieting symptoms.

This poisonous action may be due to putrefaction. Tainted meat, it is well known, is unfit for human food, and rotten fruit is a frequent cause in hot weather of severe diarrhœa.

Meat, especially pork, may be rendered poisonous by the action of specific germs which cause chemical changes distinct from those of ordinary putrefaction. This occurs in cases of wholesale poisoning from the consumption of German sausages and badly cooked or preserved ham and bacon.

Meat, though fresh, may cause serious effects if it has been taken from a diseased animal. The flesh of animals which have suffered from pleuro-pneumonia and murrain may give rise to boils and carbuncles (*Stevenson*), and very probably to much more serious symptoms. Pork again, if insufficiently cooked, is a frequent source of mischief in this respect, and a parasitic disease called trichinosis, which has occurred in Germany and also in New York and Montreal, is caused by this article of food. The symptoms, which are sometimes caused by shell-fish, usually mussels and crabs, are due rather to a diseased condition of the food than to putrefaction.

Food may act as a poison, not because it is tainted or diseased, but because it has itself been poisoned. Game birds are sometimes killed by eating poisoned grain, and in some parts of Australia, it is stated, mutton is rendered poisonous by reason of the sheep feeding on poisonous plants. Preserved fruit and pickled vegetables are sometimes coloured green by salts of copper, and may, in consequence of this addition, occasion gastric disturbance.

Poisoning may be the result of mistaking some noxious kind of animal or vegetable for an edible one, as in eating mushrooms and certain tropical seafish.

Symptoms of food poisoning may be due not so much to bad

quality of the article consumed as to a peculiarity in the constitution of the consumer. Many persons may partake of the same dish and only one be affected. This susceptibility to the action of a single article of food is often observed in cases of poisoning by shell-fish.

The symptoms produced by bad or diseased food resemble, in most instances, those of an irritant poison, such as vomiting, purging, colic, and prostration. In poisoning by sausage and bad or diseased pork, the results are very severe and the nervous system is often seriously affected (intense headache, delirium, cramps, coma). In poisoning by shell-fish, nettlerash is a very common and sometimes the only symptom.

Treatment.—This should consist in giving at once an emetic of mustard (one tablespoonful to a tumblerful of warm water), and, after vomiting has been excited, an ounce of castor oil with 15 drops (*for an adult*) of laudanum. If the patient become faint and prostrated, he should be wrapped in warm blankets and be supplied with brandy in cold water at frequent intervals. A mixture of iodide of potassium with carbolic acid and aromatic spirits of ammonia has been recommended as a useful one in many cases of meat and fish poisoning (see Prescription No. XII.).

As a means of prevention, meat, especially pork, ought to be well cooked, in order that the germs that cause putrefaction and disease may be destroyed by a long exposure to great heat. Neither salting nor smoking can be regarded as effective measures. Tinned meat and fish should be consumed as soon as possible after the tin has been opened, as such food, though free from taint when first exposed, may afterwards undergo rapid decomposition in a warm climate.

HURTFUL EFFECTS OF CERTAIN DRUGS.

The following drugs included in the Scale of Medicines may cause unpleasant and also serious symptoms, when used in excess, or in consequence of a peculiar susceptibility in the patient.

Copaiba.—The use of this drug, even in small quantities, may occasion sickness and diarrhoea. It is sometimes followed by a rash on the skin, resembling in some instances measles, in others nettle rash. It may also give rise to a pain in the loins, and to bleeding from the kidneys, indicated by dark coloured or blood-stained urine. If any of these effects be produced, the use of copaiba in any form should at once be discontinued.

Carbolic acid, when applied as a lotion, may cause irritation of the skin and produce a number of small blebs, from which

there is a profuse discharge of pale fluid. If the use of the lotion be still continued, the skin will become red and inflamed, and the rash will spread to other parts of the body. At the same time the patient may become pale, and suffer from nausea and weakness. In such cases the urine will probably be of a dark green colour.

Treatment.—These symptoms will speedily disappear on using instead of the carbolic lotion some diluted Friar's balsam for the wound or ulcer, and simple ointment or starch powder and cotton wool for the blistered skin.

For the poisonous effects of carbolic acid when taken internally see p. 259.

Iodide of Potassium.—The following unpleasant effects may be caused by a large dose of this drug:—Headache, swelling of the eyelids, watering at the eyes and nose, in fact all the symptoms of a bad cold. The patient may suffer also from colic and diarrhœa, and be much depressed in spirits. An eruption on the skin may follow. Sometimes it is a diffused red rash not unlike that of scarlet fever, but usually confined to certain parts, especially the forearms. The rash more frequently consists in minute dry boils (papules) scattered over the legs, or the surfaces of the chest and belly.

Treatment.—On the appearance of any of the above-mentioned symptoms during a course of iodide of potassium, the use of the drug should be promptly discontinued, and the patient put on a fluid diet for twelve hours, and purged by a large (2 or 3 drams to 1 ounce of water) dose of Epsom salts.

Similar effects may be produced by bromide of potassium.

Mercury, whether rubbed in as mercurial ointment, or given internally as blue pill or in any other form, is apt to cause *salivation*, which, beginning with a coppery taste in the mouth, foul breath, and soreness of the gums, will, if the use of the drug be continued, cause swelling and ulceration of the mouth, loss of teeth, and it may be, destruction of bone.

Treatment.—As soon as a patient who is taking mercury complains of sore gums, the treatment should at once be discontinued. An opium pill (5 grains) should be given at night, and a dose of Epsom salts in the morning. Alum in small pieces should be frequently sucked. The best remedy for salivation, which, however, is not contained in the Scale, is chlorate of potash (half an ounce to half a pint of water) as a wash for the mouth, to be used very frequently.

Mercury may, whilst failing to produce salivation, be the cause of general weakness, low spirits, and diarrhœa. For this and

other reasons it should not be given in repeated doses in the absence of professional supervision, unless there be good grounds for belief that serious mischief may be prevented by a cautious use of this remedy (see p. 234).

Nitrate of Potash, when given in large doses (over 10 grains) may cause much pain in the stomach, and diarrhœa.

Treatment.—These symptoms will be relieved by giving warm milk and barley water, and by diminishing the quantity of the salt, or discontinuing it altogether.

Quinine often causes severe headache and deafness, with loud noises in the ears. Sometimes the sight is affected and becomes dim and misty. The face may be red and swollen and the eyes bloodshot.

Treatment.—If these symptoms do not disappear very soon after the use of quinine has been discontinued, the patient should be kept warm for a few hours, and partake freely of some effervescing water.

Tincture of Steel when given internally is apt to irritate the stomach, and produce indigestion. It blackens the stools, and the tongue and teeth are discoloured.

CHAPTER XXXI.

BANDAGES AND OTHER APPLIANCES.

ANTISEPTIC DRESSINGS—BANDAGES—FIGURE-OF-EIGHT BANDAGE—MODE OF APPLYING IT TO DIFFERENT PARTS—TRIANGULAR BANDAGE AND ITS APPLICATIONS—QUADRANGULAR BANDAGE—MANY-TAILED BANDAGE—THE T BANDAGE—BATHS—BED-CRADLES—BED-SLING—BED-STEAD—BLISTERS—BOUGIES—CATHETERS—CRUTCHES—ENEMA—FOMENTATIONS—FREEZING MIXTURES—HOT-WATER BOTTLE—ICE BAG—LEECHING—LINIMENTS—NASAL DOUCHE—PADS—POULTICES—SLINGS—SPLINTS—TRUSSES.

Antiseptic Dressings.—In the modern treatment of wounds numerous agents are used with the aim of excluding minute organisms from the raw surface during the process of healing. Among the most suitable and efficient of these are carbolic acid, corrosive sublimate, cyanide of zinc and mercury, and iodoform. As the most powerful antiseptics are poisonous, and apt to irritate the skin, it is necessary to dilute them to a considerable degree, and to take certain precautions in their application.

The usual practice is to cover the wound by thick layers of gauze thoroughly impregnated with the antiseptic agent, and, in order to ensure further security, to apply over this a large mass of medicated cotton wool, lint, or of oakum, extending far beyond the wounded part. In dealing with a case of large wound on board ship, the last-mentioned substance will be found very useful. Carbolic gauze is a valuable antiseptic dressing, but often produces a painful and troublesome eruption of the skin, and, if applied for some time to a large open surface, might cause symptoms of poisoning. Cyanide gauze, whilst equally reliable as an antiseptic, does not, it has been stated, affect the skin in the same distressing manner. Iodoform gauze is a cleansing and very useful dressing, but has an unpleasant smell, and is very costly. Of the different forms of medicated lint, that impregnated with boracic acid is perhaps the most useful and the least expensive.* Any of the antiseptic wools—salicylic, iodoform, sal-alembroth, and wood wools—will be found very useful for covering large wounds, and also sores from which there is an abundant discharge of matter.

BANDAGES.

These appliances serve many purposes, and are used for (*a*) covering and protecting an inflamed or injured part; (*b*) keeping an injured part at rest; (*c*) retaining a broken bone in good position; (*d*) causing pressure on the sides of a wound and over a bleeding vessel; (*e*) compressing and reducing the size of a swollen limb; (*f*) retaining in position splints and dressings.

The “roller,” or simple rolled bandage, such as is usually supplied with the Medical Stores, is made of unbleached calico or domett. The length of each is 6 yards; the width of a “leg” bandage is 3 inches, and that of an “arm” bandage $2\frac{1}{2}$ inches. For the chest and in cases of broken ribs, the width should not be less than 4 inches.

A bandage, when repeatedly used, may be rolled again by twisting one end between the two thumbs and forefingers, as in making a cigarette. Some practice in this will be needed before the bandage can be rolled evenly and tightly. A winding machine may be easily extemporised by thrusting a skewer across a narrow box. If this be bent outside the box, so that a handle is formed, the bandage, which should be passed through

* A long list of approved antiseptic materials will be found in the circulars issued by Mr. John Milne, of Ladywell, by whom the surgical dressings used by Sir Joseph Lister are prepared under this surgeon's directions.

two slits made from side to side at one end of the box, may be firmly rolled on the skewer by turning the handle.

As the art of bandaging is really a very difficult one, and cannot be acquired except by much experience and practical instruction, the following directions, it is feared, are not likely to be of much service, save to those who have already attended an ambulance class. They may, however, be useful for reference in cases of actual emergency, and help to remind ships' officers of some doubtful or forgotten details of the valuable lessons now given to seamen by teachers connected with the St. John and other Ambulance Associations.

In applying a bandage it is better to stand in front than at the side of the part to be bandaged.

Four or five inches should first be unrolled, and there should always be the same length between the limb and the roller.

The free or initial end of the bandage should be applied to the inner side of the limb, which is thus bandaged *from within outwards*.

The bandage should first be fixed by making two turns round the limb at the same part.

The outer surface of the unrolled portion of bandage should be applied to the surface of the limb.

The bandage should be carried from below upwards in a limb, from the foot towards the knee, from the hand towards the elbow, from above downwards in the trunk.

Firm and equable pressure must be maintained along the whole of the bandaged portion of limb. If a swollen leg or arm be tightly bandaged about its middle and loosely bandaged below, the bandage will do harm by obstructing the circulation, and thus causing increased swelling below the seat of constriction.

A limb when being bandaged should be kept in the same position and not be moved at any of its joints.

In setting a fracture a bandage should never be put round the injured limb under the splints.

Each succeeding turn should overlap about one-half or two-thirds of the preceding one.

After the whole of the bandage has been applied, its inner or terminal end should be fixed by a pin. In the case of the chest or belly it would be better to secure this end by stitching it with ordinary thread to the portion of bandage beneath. Additional security would be given by stitching the different turns of a chest bandage together. A bandage around the chest is apt to become loose with the constant movements of breathing, and a pin, if placed over the back, may cause discomfort.

A bandage when washed should never be starched.

The simplest way of bandaging is to carry the bandage round and round the limb in spiral turns, each successive turn overlapping the turn below it by one-half or two-thirds of its width. This is called the *spiral bandage*. In many cases difficulty will be found in applying this form of bandage smoothly or evenly. Either the limb will be found larger as the bandage is carried upwards, or a joint with bony projections—as in the knee or elbow—will come in the way. Then it will be necessary to practise what is called *reversed spiral bandaging*, or to apply the *figure-of-eight* form of bandage. The former, which requires much practice before it can be properly done, is made by twisting each turn of the bandage as it is carried up the limb. After a few spiral turns have been made, the unrolled portion of the bandage between the limb and the roller is slackened, the thumb of the free hand is then placed over the end of the last turn, and the loose portion is made to turn over by twisting the roller (see Fig. 59, A, B); the bandage is then tightened, carried once

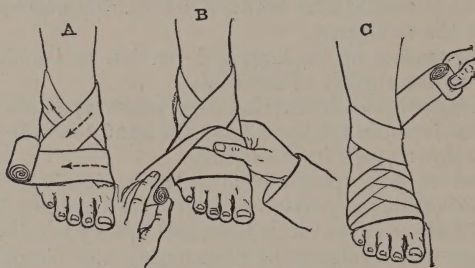


Fig. 59.—Reversed Bandage.

more round the limb, and another turn made. The reverses should always be made one above the other in a row along one side of the limb.

In the **Figure-of-Eight Bandage**, which is usually made over a joint, the roller is carried in a slanting direction—in the knee, for instance—from the upper part of the leg to the lower part of the thigh across the front of the joint, then round the back of the thigh, and back again to the leg by crossing in front of the knee the first turn. The turns are repeated until the joint is completely covered on every side. This form of bandage, which can be easily applied, may be adapted to the straight portion of a limb between any two joints when there is difficulty in applying evenly the spiral or reversed spiral forms. In doing

this, however, there will be some waste of material, as the figure-of-eight requires twice as much bandage to enclose the same length of limb as other forms of bandage do.

The figure-of-eight bandage is most useful in fixing dressings and applying pressure to the groin and the shoulder. When applied to these parts in the manner shown in Figs. 60 and 61, it is called a *spica*.

The following are the simplest methods of bandaging different regions of the body :—

The Head.—A roller bandage should be carried two or three times round the head just above the ears, and, after it has been fixed on one side by a pin, carried under the chin and over the top of the head. The turns of bandage where they cross on each side of the head should be fixed together by several pins or by stitching.

For applying pressure over a scalp wound and stopping bleeding, the knotted bandage will be found very useful. Taking

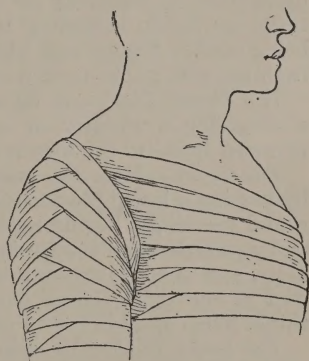
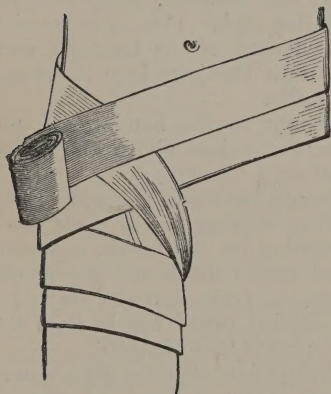


Fig. 60.—Spica Bandage (Hip). Fig. 61.—Spica Bandage (Shoulder).

the neighbourhood of the temple as the situation in which the pressure of the twist is required, the bandage should be unrolled for about a foot, and the end held in the left hand, which is kept close to the temple. The roller is then carried round the forehead and the back of the head, so that it comes back to the unrolled end at the wound. The roller is then twisted round sharply, and is carried down below the chin and round to the top of the head. When the temple is reached again a like twist is made, and the roller is once more passed round horizon-

tally, when sufficient pressure is obtained, the bandage is fixed by knitting the two ends together (*Pye*).

The objects of the so-called capeline and other complicated forms of head bandage may be just as well obtained by using the triangular bandage.



Fig. 62.
Eye Bandage.

Eye Bandage.—The roller is carried round the head just above the eyebrows and the ear, downwards over the affected eye, and then backwards along the side of the head over or below the ear (see Fig. 62).

The Shoulder.—To apply a *spica* to this region a roller bandage should be passed two or three times round the upper part of the arm, then over the shoulder, along the back to the opposite side of the body, under the opposite armpit, across the front

of the chest, and, at last, round the shoulder, being brought up in front in readiness for a similar turn. Four or more such turns are taken according to the length of the bandage, each being carried higher and higher, until the joint is well covered from the arm to the neck (see Fig. 61).

The Upper Limb.—A figure-of-eight to the hand, wrist, and elbow, simple circular or spiral turns just above the wrist, reversed spiral to the forearm and arm.

The Groin.—Here the *spica* should be used. This is formed by passing a broad ($3\frac{1}{2}$ inches) roller bandage two or three times round the thigh, beginning and ending on the inside, outwards and upwards over the groin, and round the lower part of the belly, and then downwards across the groin again to the under part of the thigh, being finally carried round the back of the thigh, when another round may be made (see Fig. 60).

The Lower Limb.—Reverse spiral to foot, figure-of-eight round ankle (Fig. 59), simple spiral on lower part of leg, reverse spiral up to the knee, a figure-of-eight over this joint (Fig. 63), spiral and reversed spiral to thigh.

Triangular Bandage.—This appliance, known as “Esmarch’s bandage,” and “the triangular handkerchief,” will be found much more useful than the roller bandage in “first-aid” work, and in the hands of those who have not had special instruction in bandaging. It has the following advantages—(1) It can be easily and quickly applied; (2) it fulfils the same purposes as a roller bandage, and is not so likely to do harm; (3) the different ways of using it can be learnt very readily; (4) it can be washed

or renewed without expense or difficulty ; (5) it can be stowed in a small space.

This bandage is simply a triangular piece of linen or calico, the base of which measures 48 inches, and the two sides 33 inches each. It can be readily made by taking a piece of the material 33 inches square, and dividing this square into two triangles by cutting from one corner to the opposite corner. The size may be varied to meet different requirements. For a large limb, or when used as a sling for the arm, the square piece of calico may measure 40 or 42 inches, and for the hand or foot, or for fixing splints, smaller bandages can be readily improvised by folding an ordinary pocket handkerchief into a triangular shape.

The upper angle A is called the *point*, and the angles B and C the ends ; the base D the *lower border*, and the sides E and F the *side borders*.

To Fold the Bandage for Stowage.—Fold it at its middle, in the line from A to D, bringing the two ends, B and C, together,

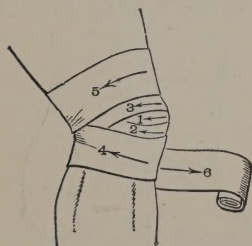


Fig. 63.—Bandage around Knee.

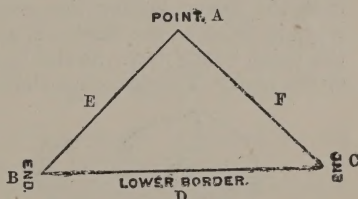


Fig. 64.—Triangular Bandage.

then bring A, and the two ends B and C, down to D, and so form a square. Fold this in half, then again twice, when a small packet is formed measuring about 6 by 3 inches.

The triangular bandage may be used either *unfolded* or *folded*. To fold the bandage the apex A should be brought down to the middle of the base D ; if the bandage be now folded once, it is *broad-folded* ; if folded again, *narrow-folded*. The ends of the bandage, when it has been applied to any part of the body, should be secured either by a safety-pin, or, preferably, by tying them together in a reef-knot.

The uses of the triangular bandage are much the same as those of a roller bandage, but it cannot be used as the latter can, when it is necessary to apply firm and even pressure to a considerable extent of a limb. It will be found of most service in keeping up pressure on a bleeding wound, in covering dress-

ings, in fixing temporary splints, and in forming slings for the arm. It can be used in no less than thirty-two different ways, all of which are shown in the *Illustrated Triangular Bandage*, devised by Esmarch, and adopted by the St. John Ambulance Association.*

A few only of the different applications of this form of bandage will be described here, as a little experience of its use will enable one to adapt it readily to any part of the body.

The Head.—For fixing a dressing or applying pressure to a wound on the forehead, or the back or sides of the head, the bandage may be folded either broad or narrow, and then tied tightly round the head. A second bandage, passed over the top of the head and round the chin, and fixed by pins to the first bandage, or looped round it on either side, will keep this from slipping.

For a wound on the top of the head, the bandage should be made into a form of cap, resembling that worn by peasant women in the south of Europe. The middle of the bandage (unfolded) should be placed on the head, so that the lower border lies cross-ways in front of the forehead, and the point hangs down at the back of the neck. The two ends should

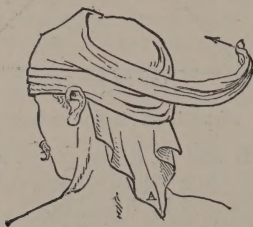


Fig. 65.—Triangular Bandage (Head).



Fig. 66.—Triangular Bandage (Hip).

then be carried backwards above the ears, be crossed at the back of the head, and then be brought forward and tied in a reef-knot. At last the point hanging down behind the neck should be drawn well downwards, so as to make the bandage tight and even, and then be turned upwards and fixed by a pin at the top of the head (Fig. 65).

* A useful little manual of instructions for using the triangular bandage has been issued by the St. Andrew's Ambulance Association. John Horn, 42 Argyle Street, Glasgow.

For the Shoulder.—Let an unfolded bandage be placed over the shoulder with the point high up on the side of the neck, and the lower border on the middle of the arm, between the shoulder and the elbow. The two ends should then be carried round the arm, crossed on its inner side, brought back, and tied in a reef-knot on the outer side. A second bandage folded narrow should now be applied as an arm sling, and the point of the first or shoulder bandage be passed under this, doubled back, and pinned over the top of the shoulder.

For the Hand.—The bandage being unfolded and spread out on a flat surface, the patient's wrist should be placed over the lower border, and the fingers be directed towards the point. The point should be turned over the fingers and carried above the wrist. The two ends should then be carried twice round the wrist and tied in a reef knot. The point may finally be secured by a pin.

For the Hip.—Either two bandages are required, or one bandage and a waist belt. If two bandages are used, one should be folded narrow and applied as a waist belt. The second bandage should be applied unfolded to the outside of the hip and thigh, with the point upwards; the two ends should then be passed twice around the thigh, and fastened on the outside by a reef-knot. The point should finally be passed around the first bandage, and be secured by a safety-pin (Fig. 66).

For the Foot.—The sole of the foot should be placed on the centre of the *unfolded* bandage, the heel corresponding to the middle of the lower border, the toes directed towards the point. The top of the foot and the instep should now be covered by the pointed part of the bandage, and the two ends be brought forwards round the ankle, crossed on the instep, and then carried downwards and tied together on the sole, or if the bandage be long enough, be brought forwards again and tied on the instep.

For the Knee and Elbow.—The bandage *broad folded* should be applied to the front of the knee and the back of the elbow with the point upwards and the lower border over the leg or forearm, and the two ends then passed to the opposite surface, crossed there, and brought back and tied.

To secure Splints.—This may be done by applying above and below the break in the bone two or more triangular bandages *folded broad or narrow* according to circumstances (Figs. 49, 52, 53).

To Improvise a Tourniquet.—A *narrow-folded* bandage should be passed round the limb over a pad placed on the bleeding

artery above the wound, next be tied, and then twisted by turning a short stick inserted under the bandage at the knot. (Fig. 22).

Quadrangular Bandage.—A light covering for the head in hot weather may be made by folding a large square handkerchief or a thin neckerchief unevenly so that the lower border passes beyond the upper border by the length of the nose. The handkerchief having been laid on the top of the head and over the forehead, the four ends hanging over the shoulders, the two outer ends are tied under the chin, and the two inner ends are passed backwards *over* the two outer ends and tied at the back of the head. The fold hanging down over the nose is then turned up and fixed by two or three small pins.

The Many-Tailed Bandage.—This is a useful appliance in cases of burn, and of broken limb with discharging wound, as it allows frequent change of dressing without any movement of the injured and painful part. It consists of a strip of bandage varying in length according to the length of the injured limb, and several other strips, which are placed across and fixed by stitching to the first, the middle of each crossing strip corresponding to the single strip (Fig. 67). The bandages being

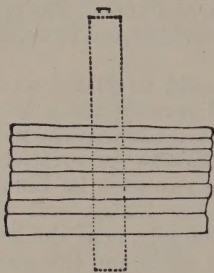


Fig. 67.
Many-Tailed Bandage.

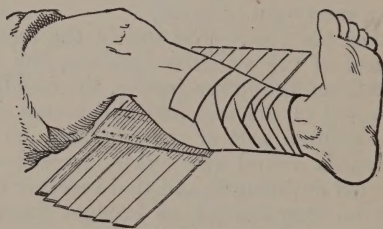


Fig. 68.
Many-Tailed Bandage.

placed evenly under the limb, the single and central strip being underneath, the strips on each side can be brought over the dressings and secured by pins (Fig. 68). When it is necessary to expose and dress the wound the side strips may be turned back right and left, and when a fresh dressing has been applied, may be folded over again.

The T Bandage is used for keeping dressings on the perineum or fork. It can be readily made by taking a piece of broad bandage to serve as a waist band, the two ends being fixed by

a safety-pin in front of the belly, and by stitching to the middle of the lower border of this a second piece of bandage, which is brought forwards between the thighs, and then slit near the end and tied in front round the belly bandage.

An extemporary T bandage may be formed from an ordinary roller by fastening it round the waist with a knot in front, and then carrying the end between the thighs on one side of the genitals, looping it over the circular band behind, and bringing it forward again on the other side of the genitals to fasten it in front (*Humphrey*).

Baths.—The temperature of a *hot* bath should not be lower than 100° and never above 110°. That of a *tepid* bath should be between 80° and 95°. In a *cold* bath the temperature of the water is below 70°.

For a strong and healthy man a cold bath or cold bathing in the sea or a river is preferable to other modes of bathing. The best time for this is either before breakfast or between breakfast and the midday meal. It is not prudent to take a very cold bath when fatigued and heated.

For feeble and unsound persons the use of a tepid bath is preferable, as the hot bath will be found too weakening, and the cold bath may cause a severe shock and disturb the action of the heart. Both hot and cold baths should be avoided by those who have a weak or unsound heart, and by old people.

An invalid should not be left alone in a hot bath.

The Alkaline or Soda Bath may be prepared by adding about half a pound of common washing soda to 30 gallons of warm water.

The Bran Bath is made by boiling 4 pounds of bran in 1 gallon of water, straining, and adding the liquor to 25 or 30 gallons of hot or warm water.

The Glue Bath.—6 lbs. of size to 30 gallons of warm water.

The first of these will be found useful in certain chronic eruptions of the skin; the two latter for itching and irritable rashes, and especially after the application of sulphur ointment for scabies or itch.

The Mustard Bath.—This, which is generally used as a foot bath, is made by adding a handful of mustard to a sufficient quantity of hot (110°) water for the feet and legs.

Bed Cradles are very useful in keeping off the weight of the bedclothes from a wounded limb or a tender and inflamed part of the body. An appliance of this kind can be readily extemporised by fixing together three or four half-circles of stout wire, small barrel hoops, or pliable pieces of wicker or cane, by narrow

strips of wood. Fig. 69 represents one made up of telegraph wire. A small cradle for protecting the forearm or leg may be made by cutting up an old basket or a hat-box. In hot weather,



Fig. 69.—Bed Cradle.

and when flies are plentiful, the open cradle should be covered by gauze or muslin, and the injured part left uncovered by bed-clothes.

Bed Sling.—A useful sling, designed by Porter, for the more convenient treatment of bed sores on the lower part of the back and the buttocks, consists of a strip of clean canvas, 18 by 24 inches. At either end it is stitched on to two pieces of strong wood about the diameter of an ordinary office ruler, which keeps the canvas expanded when under the patient, and forms a means of fastening the stays, which are spliced together and attached to 3-inch blocks. These blocks have ropes passing through them and through blocks of the same size attached to poles or uprights, by which means the sling can be raised or lowered. A piece of canvas, round in shape and 4 inches in diameter, is removed from the centre of the sling, through which the sores can be dressed or cleaned. In applying the sling it is necessary to place

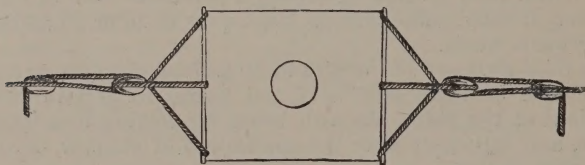


Fig. 70.—Bed Sling.

a mattress doubled at one end under the patient's shoulders, the thin end extending to the loins. A pillow should be placed under the knees, and, except for dressing the sores, the patient should not be raised more than one inch off the bed* (see Fig. 70).

Bedstead.—If the climate and weather permit of the patient

* Porter and Godwin, *The Surgeon's Pocket-Book*, p. 217.

being kept on deck, a small boat can be made to answer the purpose of a bedstead. Rough trestles, on which a stretcher could be laid, or a framework of wood, which could be slung from the ceiling, might be readily made up by the carpenter.

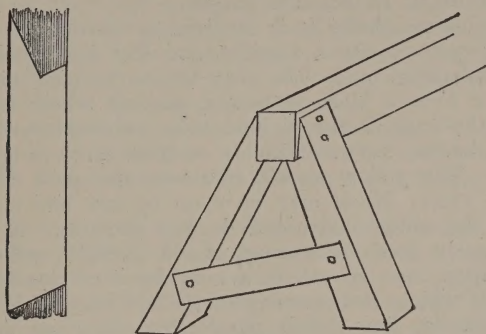


Fig. 71.—Bedstead.

Blister.—A blister may be made by applying blistering fluid (see p. 36) with a camel's hair brush, care being taken that none of the fluid runs beyond the skin that has to be blistered. The moistened part should be covered for six or eight hours by a piece of oiled lint. When the skin is raised and a blister formed, this should be pricked in three or four places by a clean needle that has just been dipped in boiling water. After the yellow fluid has run away, the blistered surface should be covered by a piece of lint or linen smeared with vaseline. If this method of forming a blister fail, the fluid should be applied again, and the moistened surface be covered for three hours by a piece of oil-silk or guttapercha tissue.

Bougies.—A bougie is a straight flexible instrument used for dilating or keeping open a stricture of the urethra. It resembles a flexible catheter in shape, but is not hollow. It is of very little use in the hands of any one save a surgeon or a patient who has had long practice in the passing of urethral instruments. As there is no flow of urine when the instrument is used it is always doubtful whether it has passed into the bladder or not.

Catheters.—A catheter is a long hollow instrument used for dilating stricture of the urethra, or for drawing off urine from the bladder in cases of "stoppage of water" from spasm, stricture, or enlargement of the prostate. It may be curved and made of metal, or straight, soft, and very flexible. The gum-elastic

catheter though flexible does not yield very readily, and when set on a curved wire, as it usually is, is almost as firm as a metal instrument. A complete set contains a dozen numbered catheters, No. 1 being the smallest and No. 12 the largest; each catheter is about 11 inches in length.

In passing a catheter it is much more convenient and much less dangerous to use a straight and soft instrument than a curved and metal one. The best to use in cool climates are either the French black catheters, each of which has a small bulb at the end, or the English silk web catheters. These, however, become very soft in hot weather and are apt to stick together. The yellow elastic catheters are more durable and easier to keep. Much may be done by care and attention to preserve the softest instrument in hot climates. A good way of keeping in good order a set of soft straight catheters is to enwrap them *one by one* in a long piece of clean linen, the surface on which each instrument is laid being thickly dusted with magnesia, fine starch powder, or soap-stone dust. The catheters thus enclosed in a folded linen case should be kept in a cool place.

No supply of catheters should be considered complete unless it includes a full-sized soft catheter made of vulcanised india-rubber. This will be found very useful in cases of stoppage of water not due to stricture. This can usually be passed without any difficulty, can do no mischief to the urethra or bladder, and is less liable to cause irritation than any other kinds of catheter when allowed to remain for some hours. This is by far the best catheter in the hands of any inexperienced person or of the patient himself, but cannot be used in cases of stricture.

Care should be taken to clean the catheter immediately after it has been withdrawn, as the use of a dirty instrument may cause swelled testicle and inflammation of the bladder. The catheter should be immersed in cold water for two or three minutes and then be held upright with the open end downwards so that the water may run out. This should be done about half-a-dozen times, and the instrument be blown through from the open end and then thoroughly dried.

When there has been much difficulty in passing a catheter into the bladder it may be advisable to let it remain, and to "tie it in." This should be done by tying the middle of a piece of thread around the end of the catheter, and by fixing the ends either by a piece of sticking-plaster passed around the penis, or, if the patient be hairy, by tying them to tufts of hair just above the privates

Crutches.—A pair of simple wooden crutches may be readily made by the carpenter, or, if wanted at once, may be extemporised by trimming two old brooms and wrapping some canvas round the brush of each. The crutches should not be too long so as to slope far outwards when used, but be of such length as to enable the patient to stand on the sound limb and to swing the other. The lame leg should be slung in a long piece of bandage sewn together at the ends, and passed round the neck and under the sole of the foot.

A patient who has been laid up for some weeks with a broken leg should not be allowed to move about on crutches without assistance at first, lest he should fall down and break the limb again.

It often happens that when crutches have been used for some time that the patient's hands become numb and drop at the wrist, in consequence of pressure of the hard handles on the nerves in the armpit. This may be prevented by shortening the crutches and padding the hard handles with tow and canvas.

Enema.—An injection of fluid into the lower bowel used either to cause purging, or to supply nutriment and stimulants in cases of extreme exhaustion and vomiting. The best instrument for the former purpose is a Higginson's syringe. The brass syringe with elastic tubing usually supplied in medicine chests is quite useless. For giving a nutrient enema a ball syringe will be found more convenient (see Fig. 72).

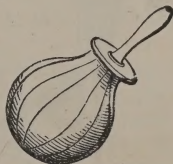


Fig. 72.
Ball Syringe.

In giving a purgative enema, the bone nozzle at the end of the elastic tube should be greased with sweet oil or vaseline, and passed for its whole length very gently through the anus. The fluid should be injected slowly, and care taken that no air is mixed with it. As the tube is withdrawn a large pad of tow or a soft towel should be pressed against the anus.

A nutrient enema should be given slowly and in small quantity, not more than 3 tablespoonfuls at a time. In cases of alarming prostration, when strong coffee, beef tea, or brandy are used, the injection must be frequently repeated.

The simplest form of purgative enema is one of 2 pints of soap and warm water. In obstinate constipation an injection may be used of 1 pint of warm olive or linseed oil. The oil may be warmed by immersing the basin containing it in another vessel of hot water.

Fomentation.—This consists in the application of moist heat

by means of flannel, linen, or sponges to the surface of the body. A fomentation has the same effects in relieving pain and reducing inflammation as a linseed poultice, but is lighter, cleaner, and more comfortable to the patient, and much less difficult to prepare. It has the disadvantage, however, of losing its heat quickly, and so of needing very frequent change.

A simple fomentation is applied by wringing out a double layer of flannel in boiling water. This may be done by dipping the flannel in the water, removing it with a pair of tongs or nippers of some kind, and by squeezing out the hot water by wrapping it in a towel, the ends of which are tightly twisted. If it be necessary to continue the application of fomentations for some time, a wringer may be readily made by attaching a

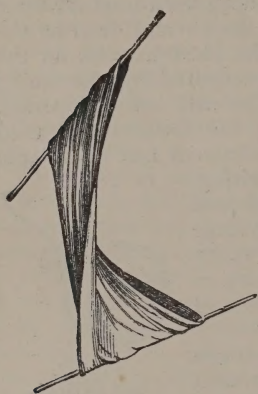


Fig. 73.
Fomentation Wringer.

short stick to each of two opposite sides of a square piece of canvas. By twisting the two sticks in opposite directions the hot water may be squeezed out of the flannel without risk of scalding the fingers.

The fomentation when applied to the skin should be covered by a piece of mackintosh cloth, or some other waterproof material, or a thick layer of tow or felt. When the inflamed or painful surface is not very extensive, a sponge wrung out in the same way may be used instead of flannel. Spongio Piline is an excellent material for applying moist heat.

Neither fomentations nor poultices should as a rule be applied to a wounded or ulcerated surface.

A *Poppy Fomentation* is made by breaking up two poppy heads and boiling them in 2 pints water until the quantity of the latter is reduced by one half. A piece of flannel is dipped in this fluid after it has been strained, and is then wrung out and applied like the simple fomentation.

A sedative or pain-relieving application can be more readily made by sprinkling a simple fomentation with half an ounce of laudanum. This will be found useful in cases of colic and severe pain in the belly.

A *Turpentine Fomentation or Stupe* is made by sprinkling over the hot and moist flannel from half an ounce to 1 ounce of turpentine. This is most beneficial in cases of inflammation of the

chest (bronchitis, pneumonia). As turpentine, like mustard, is an irritating agent, care must be taken to prevent blistering, by applying only simple fomentations where the skin is very red.

Freezing Mixtures.—In opening an abscess, or in cutting out any foreign body, such as a piece of metal or a splinter of wood, fixed near the surface of the body, the skin may be so benumbed by the application of cold so as to be quite insensible when divided by the knife. The patient's dread of a cutting instrument may be thus quieted; but although he may not feel the knife, it is questionable whether the freezing of the skin and the subsequent thawing may not cause more actual suffering. The simplest means for producing extreme cold is a mixture of common salt and pounded ice. This, when applied to the skin in a muslin bag, will in the course of a few minutes render the surface hard and white. A mixture of snow and common salt, or one of sal ammoniac (3 ounces), nitre (3 ounces), and half a pint of water, will have a like effect.

A very good agent for freezing the skin and producing what is called local anæsthesia is ethyl chloride, supplied in a small cylinder, from which, when the nozzle is removed, a thread-like jet may be directed on a small surface. The action of this jet will be quickened by blowing over the portion of skin to which it is applied.

Hot-Water Bottle.—This is a very useful appliance in cases of collapse and extreme prostration from injury, poisoning, and loss of blood, and in the cold stages of cholera and of malarial fever. Any large stone bottle will serve the required purpose. It should, when filled with hot water, be *tightly corked, and wrapped in a piece of blanket or of canvas*, so that the patient's skin may not be scorched or blistered. The usual practice is to place one bottle near the feet, but in severe shock, when the patient is very cold and collapsed, several should be applied—one to each side of the chest and another between the thighs.

Ice Bag.—If a proper india-rubber bag cannot be obtained, a sheep's bladder, or an improvised bag of oil-silk or any other thin waterproof material, will be found just as useful, though not quite so convenient. As the ice melts rapidly when applied to warm skin, it should be frequently renewed and the water be frequently poured off. If the ice should cause much pain, and the surface to which it is applied become cold and pale, a piece of lint or linen must be placed between the bag and the chilled skin.

The application of an ice bag will be found beneficial in cases of high fever with headache and delirium, in sunstroke or heat

apoplexy, in cases of injury to the head, in rapid swelling of a joint or of the scrotum due to injury, and in extensive bruises.

Leeching.—If leeches be ordered by a medical man, they may be applied by simply placing them on the skin of the part which is to be leeches, and covering each with a small wine glass, a pill box, or a strip of paper twisted into a cone. The surface of the skin should be cleaned before the leeches are applied, and if any refuse to bite, the part may be moistened with a little milk or sugar and water. Any further difficulty will very probably be overcome by applying a sponge that has just been dipped in very hot water, and afterwards making a slight prick with the point of a needle, so as to draw a drop of blood, which may attract the leech and induce it to bite. Each leech, when it has taken, should be allowed to remain and distend itself until it drops off. If the bleeding be very slight, it may be encouraged by applying a hot sponge; if it be too profuse and continue for some time after the removal of the leeches, it may be stopped by placing a very small piece of lint or cotton wool over each bleeding point, and by pressing this with the finger for about a quarter of an hour. If the bleeding still persist and cause anxiety, and medical help cannot be obtained, a small sewing needle, previously dipped in boiling water, should be thrust across the small wound just below the skin, and a piece of cotton be passed round and round beneath this, and tied.

Leeches should never be used a second time.

Liniments.—These are thick and oily fluids which are rubbed into the skin of painful parts—most frequently rheumatic joints—either for relieving pain or for stimulating the surface. As the rubbing should be kept up for some time—at least a quarter of an hour—and may need to be repeated several times in the day, the patient should be taught to make this application himself. A small quantity, about a teaspoonful, should be taken into the hand and rubbed gently over the painful part until the skin is dry. In most cases warmed olive oil and vaseline will answer the required purpose, as the long-continued friction of the hand probably does as much good, as any drug contained in the fluid. The liniments of opium and turpentine instructed in the Board of Trade Scale should be served out in very small quantities, and used with much caution, lest they be swallowed by mistake, or be mixed during rough weather with any article of diet.

Nasal Douche.—This consists in a piece of narrow india-rubber tubing about 3 or 4 feet in length, one end of which should be “weighted” by a bullet or some other heavy body, and

the other attached to a bone nozzle or short piece of solid tubing. A piece about 2 inches in length of a No. 8 catheter would be a fair substitute. The elastic tube should be divided about 3 inches from the weighted end, and the two ends of the divided tube be fixed to the ends of an intermediate piece of *solid* tubing bent so as to form a syphon. The tube having been filled with water by means of a syringe, its weighted end is then immersed in the vessel containing the lotion, which is raised above the patient's head, whilst the other end to which the nozzle is attached is passed into the nose, as far as it will go. If the man, holding his head over a basin or bucket, keep his mouth open, the lotion, after it has washed out the deep portion of the nose, will flow out by the nostril and not pass into the throat. The object of this contrivance is to keep up a continuance and strong flow of the lotion by syphon action. Any of the following solutions will be found useful in this treatment:—Condy's fluid, Burnett's fluid, or tincture of steel (half a dram of each to a pint of tepid water), or carbolic acid, or tincture of iodine (see Prescriptions for External Use, Nos. 1 and 2).

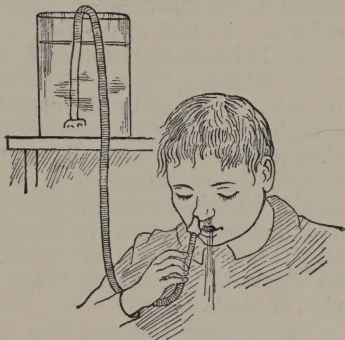


Fig. 74.—Nasal Douche.

Pads.—In setting a broken limb a soft pad or cushion should always be placed between the sensitive and probably bruised skin and the hard material of the splint. If the patient can be removed at once for professional treatment, and a "first-aid" appliance be all that is needed, the skin will be sufficiently guarded by applying the improvised splint over the clothing. When it is necessary, on the other hand, for the captain to treat the fracture himself, he should take care to cover the inner surface of each splint by a thick pad of the same shape as the splint and a little larger in every direction, so that it may extend beyond the sharp edges of the wood or metal. This pad should consist of soft material enclosed between two layers, of the required size and shape, of soft and *clean* linen, flannel, or muslin, which layers should then be stitched together all round. Suitable material for filling this bag can be readily obtained under even the most unfavourable conditions for treating a fracture; and a

good pad may be made with cotton wool, chaff, cut straw, hair, cut paper, feathers, dried sea weed, bran, dried leaves, felt, sawdust (*Porter and Godwin*). There ought to be no difficulty in making a good pad on board ship, as no better materials for such purpose can be found than oakum, tow, and cotton waste.

In a case of fracture with wound, or, if there be any wound or sore on the broken limb, the outside bag should be well boiled before it is used, and the padding should consist of oakum. As soon as the pad is at all stained by blood or matter it should be destroyed and replaced by a clean pad.

Poultices.—*Linseed Poultice.*—In making this, crushed meal is gradually added by the hand or a large spoon to boiling water contained in a basin. As the meal is being added, the mixture should be stirred with the handle of a large spoon until a thick paste is formed, and just at the last a little olive oil should be added. The mass, which must be neither too dry nor too moist, and free from lumps, should now be evenly spread on a piece of clean linen or on a layer of tow. The proportions of meal and boiling water should be about 4 ounces of the former to half a pint of the latter.

The linseed poultice is a soothing application in cases of abscess, of painful inflammation and swelling in a limb, and in internal inflammation, particularly of the lungs. It should, as a rule, be applied over unbroken skin, and in cases of abscess be changed for some other dressing when the swelling has burst and there is a free discharge of matter.

Unless *well made and frequently renewed* (every two or three hours), poultices perhaps do more harm than good, and certainly cause much discomfort. In cases of wounds and ulcers they are positively dangerous, as they may serve as breeding grounds for those minute organisms which cause so much mischief when admitted into the body. Unless poulticing be ordered by a medical man, it would be well to trust to hot flannels and fomentations in cases of internal inflammation, and to frequent bathing in *hot* water, with the subsequent application of warm vaseline or sweet oil and cotton wool, in cases of boils, unbroken abscess, and superficial inflammation.

Mustard Poultice.—This may be made of equal parts ($2\frac{1}{2}$ ounces of each) of mustard powder and linseed meal, and half a pint of hot water. The mustard is first mixed with 2 to 3 ounces of lukewarm water, and the mixture then stirred with a poultice formed by adding the linseed meal to 7 or 8 ounces of boiling water. The mass should then be spread on linen or tow.

The mustard poultice is a valuable application in cases of internal inflammation, of severe and obstinate vomiting, and of extreme prostration from poisoning or injury. If it produce the desired effects and cause smarting and redness of the skin, it should be removed within half an hour, and the reddened surface be smeared with vaseline or sweet oil and covered by lint or cotton wool. In cases of bad cold on the chest, and of lumbago, sciatica, or a rheumatic stitch in the chest, the benefit of a mustard poultice, without the trouble of preparing this, may be obtained by applying a "mustard leaf."

Charcoal and yeast poultices are sometimes ordered by medical men, the former to purify a foul and sloughing sore and to remove the bad smell, the latter to relieve pain. The charcoal poultice is made by sopping a handful of soft bread in half a pint of boiling water, next adding the same quantity of linseed meal and half an ounce of wood charcoal or, failing this, bone black such as is used by painters, and stirring up the whole mass. If charcoal cannot be obtained, a thick layer of soft and carded oakum dipped in hot water will be found a very good substitute for this kind of poultice. The yeast poultice is composed of about a quarter of a pint of yeast, 12 ounces of flour, and a quarter of a pint of warm water. The yeast is mixed with the water and stirred in the flour, and the mass is placed near a fire till it rises.

Slings.—An arm sling is useful in affording support to the limb in cases of wound, fracture, or dislocation, and in enabling the patient to move about with comfort during the period of treatment; also as a "first-aid" appliance if it be necessary while the vessel is in port to send the injured man on shore to a doctor or a hospital. In every case of deep bleeding wound of the hand or arm, and of supposed fracture or dislocation, the limb should be well slung up before the man is removed.

The triangular bandage (see p. 273) may be made into several forms of sling, of which these two are the simplest and most convenient.

Small Arm Sling.—Fold the bandage into the form of a broad cravat and tie the ends together behind the patient's neck, so that the wrist is supported a little above the level of the elbow. This should be used in cases of wounded hand and of fracture of the arm above the elbow (Fig. 75)



Fig. 75.—Arm Sling.

Large Arm Sling.—Apply the triangular bandage *unfolded*, with one end hanging over the shoulder of the injured side and the other hanging down behind the injured arm. The latter end is then brought up in front of the limb to the shoulder on

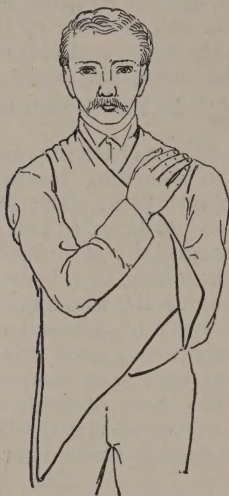


Fig. 76.—Arm Sling.



Fig. 77.—Arm Sling.

the sound side, and is tied to the other end behind the neck. The loose point of the sling should then be brought round the elbow and pinned in front (Figs. 76, 77).

Extemporaneous Slings.—One is very easily made from two ordinary pocket handkerchiefs by tying one loosely round the neck, and, after laying the forearm diagonally on the other, tying its two side corners within the first (Fig. 78).



Fig. 78.—Sling.

The skirt of the coat may be slit, and turned up and secured by pins or stitching (Fig. 79).

The sleeves of the jacket and shirt may be slit up and secured to form a sling.

Splints.—Wooden splints of suitable shape and size may be readily fashioned by the carpenter out of thin boards. They will be found useful in fractures of the

arm, forearm, and leg. They are applied to one or both sides of the injured limb, or on back and front, and are fixed in position by bandages, folded handkerchiefs, straps, or the like. As the hard wood, if applied directly to the skin, would cause much discomfort, and produce blisters or open sores, the inner surface of each splint should be lined by a thick pad made of some soft material (tow, oakum, cotton wool) enclosed in a bag of clean linen. The pad should be larger than the splint in order to protect the skin against the edges of wood.

It would be better to use, if possible, instead of hard unyielding wood, some form of firm but yet pliable splint which might be readily applied to the whole surface of the injured limb, and so afford general support. Of these the best is that known as Gooch's splint, which consists of thin strips of wood glued to wash-leather. Useful forms of pliable splint may be made of wire netting, sheet lead, tin, leather, felt, and moistened millboard. A very good substitute for Gooch's splint may be made by tying together bundles of Esparto grass, or twigs (Fig. 80).

When only one of the leg bones has been broken, and there is very little deformity of the limb, and in cases in which, after



Fig. 79.—Sling.



Fig. 80.—Twig Splint.

confinement to bed for two or three weeks, union of the fracture has already commenced and the surface of the skin is quite sound, it will be found convenient to apply some *stiff bandage* or a *light but firm casing* so that the patient can move about on crutches and get fresh air.

The material most frequently used for this purpose is plaster of Paris, which is included in the Scale of Medical Stores. When fresh and properly used it sets quickly and forms a firm and clean casing. It is very bulky, however, and is apt to deteriorate and to become damp if not well stored. In making a plaster of Paris bandage, the powder, which should be dried before using,

is rubbed into the meshes of an unrolled muslin bandage. The bandage is then loosely rolled and placed upright in a basin of cold water where it is allowed to soak for about three minutes. It is then rolled round and round the limb like an ordinary bandage, a mixture of plaster and water of the consistence of thick paste being finally smeared over the surface. Before applying the bandage the skin of the injured limb should be protected by a flannel bandage or by pulling over it from the toes to above the knee a well fitting and *clean* stocking.

The plaster of Paris bandage, except in experienced hands, is not a satisfactory appliance. In most instances it sets badly and forms a loose and friable casing which breaks down when the leg is moved. On the other hand, if it sets well the casing becomes so hard that it will be difficult to remove it except by the use of a small saw or a chisel.

A more convenient way of using plaster of Paris is to cut out two pieces of thin flannel, corresponding in shape (Fig. 53) and size to the outer and inner surfaces of the leg. These pieces should be dipped into a thick mixture of plaster and water made by adding the plaster gradually as the water is being stirred by a spoon; and then be closely fitted to the leg and fixed by an ordinary dry bandage. These side splints can be readily removed from time to time by undoing the bandage.

Another simple and useful appliance is that known as the Bavarian splint, which is made of a double layer of strong flannel stitched along the back, and shaped as in the diagram (Fig. 81). The leg being raised, the flannel is applied with the stitch behind. The

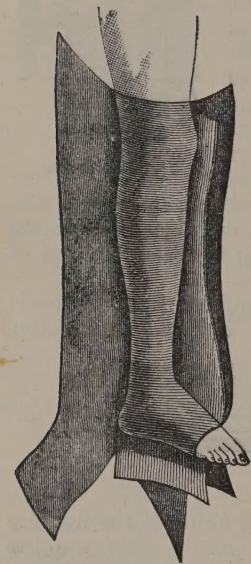


Fig. 81.—Bavarian Splint.

two sides of the inner layer are brought over and pinned in front, while those of the outer layer fall back. Plaster of Paris is next mixed, and spread over the outer surface of the inner layer, to the thickness of about $\frac{1}{2}$ inch; the outer layer is then brought over, and a firm splint is thus applied.

If there be any difficulty in obtaining fresh and dry plaster of Paris, a firm casing may be made by bandaging the limb with

thick flannel, and applying over this strips of pasteboard or cardboard, softened by hot water and then smeared over with a mixture of starch and water. These should be fixed and well moulded to the limb by an ordinary bandage, rolled in, and afterwards covered by the solution of starch. A hat box will afford suitable material for the splints. The starch mixture should be prepared by making a thick paste of starch and cold water, and then adding hot water till the paste becomes fluid and can be poured out of a spoon. The starched casing takes a much longer time (24 to 30 hours) to dry, and is less firm than the plaster of Paris bandage.

Bandages may be stiffened in like manner by using flour paste, gum shellac, glue, and a mixture of gum and powdered chalk. The casing may be strengthened by interposing strips of pasteboard, tin, sheet lead, a folded newspaper, strips of bark, &c.

Trusses.—A truss is an appliance by means of which a rupture when pushed up can be retained in the belly, and prevented from increasing in size and becoming strangulated (see p. 223). Every ruptured person should wear a suitable and well-fitting truss,

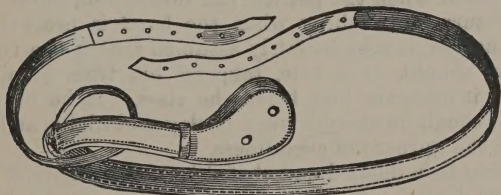


Fig. 82.—Truss.

which might possibly cure a small rupture, and would certainly prevent much discomfort, and ward off very serious evils. To these evils sailors are especially liable by reason of their active life and strong muscular exertions. A truss such as is worn for rupture in the groin consists usually of an elastic band of steel passing round the whole or part of the body above the hips, and a pad which rests on the opening through which the rupture comes down. There are many different patterns of truss, which vary chiefly in the form of the pad and its mode of attachment to the steel band or spring.

In the first application of a truss the patient must lie on his back and put back the rupture. The pad should be applied over the seat of the rupture and the band be carried round the body. The leather belt at the other end of the band is then buttoned to the front of the pad, and a second strap, made either of leather

or cloth, which is attached to the middle of the truss behind, is brought forwards under the fork and attached to another button on the front of the pad. This second strap keeps the truss in its place, and prevents it from "hitching up."

The truss should fit well, being neither too loose nor too tight. It should be strong enough to keep up the rupture, and yet not so strong as to cause pain and chafing of the skin. The pad should be of sufficient size to cover more than the opening, so that the rupture will not slip down by the side of it. The patient, when first fitted with a truss, should test its suitability by walking about, to make out whether it be comfortable or not, and afterwards by sitting on the edge of a chair or bench, stretching out his legs and coughing, in order to prove whether it be of sufficient strength.

In applying a truss care must be taken to make out whether the man has really a rupture, and that, if there be any swelling in the groin or purse, it be not a bubo, a swelled testicle, a hydrocele, or a varicocele. If the swelling expands when the patient coughs, and goes back readily with a gurgling noise when it is handled or when the patient lies down, and, moreover, if it does not return on coughing when the hand is pressed over its former situation, it may be fairly assumed that it is a rupture.

The man should, as a rule, take off his truss at night, and always put it on again just before he rises. If he be troubled with a bad cough he should wear it day and night, and remove it only for the purpose of cleanliness.

If the skin be reddened and chafed by the pressure of the pad it should be dusted with fine starch or flour and be kept very dry.

Should the patient have the misfortune to break a truss, which he has worn for some time, and find much difficulty on board ship in obtaining one which will fit him, he should place a pad of linen over the seat of the rupture, and fix this by a spica bandage (see Fig. 63). This, however, will be but a poor substitute, and he should take the earliest opportunity of obtaining a suitable truss on shore.

For ruptures which cannot be pushed back into the belly (irreducible ruptures), and for ruptures at the navel, special trusses will be required, for which accurate measurements must be made in each case.

CHAPTER XXXII.

COOKING ON BOARD SHIP.

Conditions required for good Cooking :—RECIPES FOR BREAD—CHEESE
—COFFEE—BISCUIT HASH—CLARIFYING FAT—PORRIDGE—POTATO
SOUP—RICE—TEA. Recipes for Invalids :—APPLE WATER—ARROW-
ROOT—BARLEY WATER—BEEF TEA—JELLY—LEMONADE—LIME-JUICE
DRINK—LINSEED TEA—MILK—OATMEAL GRUEL—SOUP—STEWED
MUTTON—TOAST AND WATER.

A QUESTION now being asked by many people is—Why should not the sailor have his food properly cooked? He is no longer compelled to exist on “salt horse” and “hard tack” alone, but, of late, his food has been much improved in quality and variety. There are good grounds for believing, however, that much of this food, improved as it is in many respects, is prepared in a dirty manner, and improperly and badly cooked. Much might be done if in the Mercantile Marine, as in Her Majesty’s Service, the galleys were inspected daily, and both owners and captains would find it as beneficial to their own interests, as to the interests of their crew, to consider the question why the culinary art should not be practised on board ship as well as on shore. A clean and capable cook can do much service at sea by keeping the men, not only in good health, but also in good spirits. Discontent often arises amongst a crew, not so much on account of the bad quality of the food, as of the dirty and slovenly way in which it is cooked and served.

The secret of good cooking on board ship, as elsewhere, is cleanliness and economy. The cook should keep both himself and his galley clean; all his utensils should be clean within and without; and drawers, cupboards, and shelves should be kept scrupulously tidy and free from cockroaches. If no dirt be allowed to accumulate these insects will feed the more greedily on any poison that may be scattered about, and so be killed off. The captain, or one of his officers, should pay some attention to these points, as it is only by supervision and encouragement that the cook can be led to attend to this part of his duty, and to take pride in his work.

The cook should always have plenty of hot salt water ready after every meal so that the men can wash their plates, &c. The men, as a rule, use tin plates and pannikins, scratched by constant use, and by the action of vinegar. If these be not

cleaned, rust and verdigris collect and render them foul. If the men know that water is kept ready for them they will not fail to wash their feeding gear after every meal. A suitable place also should be provided for the men to keep their food in. Whether stored in an open locker in the forecabin, or, as is often the case, in a spare bunk, or even in an occupied bunk, meat must be rendered unwholesome, particularly in warm weather, by the close and damp air. A safe of perforated zinc might, at very little expense, be placed outside the sleeping quarters.

There is in many ships a great waste of vegetables through want of care and knowledge on the part of the cook. Vegetables are usually hung up under a boat, where they are either dried up by heat, or spoilt by salt water. Onions, so invaluable in a ship's dietary, are often retained in bags and allowed to rot there, instead of being laid out on straw and then carefully covered by another layer of straw and kept in a dark place. To keep carrots, turnips, and cabbages fresh at sea, which, however, is a difficult matter, they should be placed in the coal-bunker, usually the driest and darkest part of the ship, the stalks of each being fixed into the coal.

There is much waste also of potatoes, and too often very little, if any, care is taken to prevent these vegetables from rotting. By the following method potatoes have been preserved during a passage of seventy-six days from London to Australia and a homeward passage of ninety-eight days:—The potatoes were taken on board a few days before starting when they were sorted and carefully handled and put in scalding water for a few minutes, they were then dried in the wind and shade, not in the sun, and, when quite dry, either placed in bags or packed in straw, and kept in a dark and dry place. With very little assistance, and by using some scalding sea water in the steep-tub, the cook can in a short time prepare in this manner a ton of potatoes.

In preserving eggs the main object is to render the shells impervious to air. This may be done by greasing well each egg with fat or lard, packing it end downwards, and occasionally reversing it; or by dipping it in white wax.

Fresh meat, when taken on board, should be hung up in a dark place, and not allowed to lie on the deck. If it is to be salted, the salting should be done at once. A simple way of preserving meat, so that a "fresh" steak may be cut now and again for several weeks, is to remove all the bone, cut open the meat, prick it well over with a knife, rub in brown sugar and

black pepper, roll it up tightly in a sheet of canvas, and hang it in a dark place. Meat, however tough it may be, and, as a rule, the meat in tropical parts is very tough, should not be beaten, as the fibres of the flesh are thus broken, and what juices they contain are lost in the process of cooking.

Fat is heated to the right point for frying (400°) when a thick smoke arises from it. It is a mistaken notion that fat is quite hot enough for frying when it hisses and bubbles. Then it is heated only to the boiling point of water, the steam of which causes the well-known noise, which leads one to think that the fat itself is boiling. Fat boils at a temperature between 600 and 700° , and then would burn meat at once to a cinder, and become converted into butyric acid, which, when taken into the stomach, causes heartburn, and other symptoms of indigestion.

The best way of cooking tough meat is to stew it after it has been soaked for an hour or longer in vinegar and water. It should be put into boiling water and boiled for about ten minutes, and afterwards stewed in water kept at, or near, a temperature of 180° . To cook tough meat by first boiling and afterwards baking it will make it tougher still. It would be far better to reverse the process, and put it at first into a sharp oven for half an hour or longer until it is well browned, and afterwards into water or some stock, where it can be stewed for two hours or longer, according to the size of the joint. If some vegetables be stewed with this, and browned flour and seasoning be added, a useful and agreeable dish of soup, meat, and vegetables together may be thus prepared.

All meat for baking should first be put into a sharp oven for at least half an hour, in order to harden the outside of the joint and to confine the juice. The burnt fat should always be cut away, as fat heated beyond 400° is rendered very unwholesome. In baking meat a quarter of an hour should be allowed for every pound, and an extra quarter of an hour for the whole, for beef; and twenty minutes for every pound, and twenty minutes over for pork and veal.

The cook should be supplied with a thermometer. In the absence of one a simple way of testing the heat of the oven is to sprinkle some flour on the second shelf. If this becomes a light brown colour within one minute the oven will be sufficiently heated, the temperature over the lower shelf being about 400° , and right for bread and pastry, and on the upper shelf about 410° , a suitable heat for meat at first.

Notwithstanding the firm belief of every old sailor that he knows well how to boil salt meat, the results of this culinary process, as usually practised at sea, cannot be regarded as satis-

factory. The cook turns out at eight bells, lights his fire, and makes the coffee, which is served out at two bells. He then puts his salt meat in the copper, the water in which, as the copper has been on the stove for over an hour, is almost boiling. The meat is at once hardened and the salt retained, so that when the joint is served it is found to be tough and very salt. The meat should be soaked during the night, the water being changed two or three times. This the men will readily do to oblige a good and considerate cook. It should be put in the copper as soon as the cook is about, so that it may be gradually heated, and the salt drawn from it. If, when the water is boiling, the meat still remains salt, cold should be substituted for boiling water, and the heating process renewed.

RECIPES.

The following are some few recipes that will be found useful at sea. The cook should endeavour to give as much variety as possible, for on board ship, as elsewhere, people get tired of the same thing being served over and over again. Both cook and steward should always bear in mind that a few simple articles of diet may be served in many ways :—

Bread.—Yeast may be made on board ship by placing in two quarts of cold water two handfuls of hops and two potatoes sliced, with a pinch of salt. The mixture should be heated, but just as it is on the point of boiling it should be allowed to simmer for about twenty minutes. The slices of potato should then be mashed and strained. Then, whilst this yeast is warm (98 degrees), 3 ozs. of sugar and 4 ozs. of flour should be added. This, if bottled, will be ready for use after forty-eight hours. If a little German yeast be added it will be ready in half this time. A little of it should always be reserved to add to any fresh brew. It should not be kept in a very warm place. It is ready for use when it has done working and the flour has sunk to the bottom and a white froth has formed on the top. Three-quarters of a pint of this will make 14 pounds of bread. In making the bread the water should not be too hot, else the yeast would be killed. Instead of adding salt a mixture of equal parts of fresh and salt water may be used; the bread will be much lighter. If the dough be rather sour, as it often is in hot weather, the addition of a little carbonate of soda dissolved in warm water will remove this sourness. Yeast can always be kept in readiness by making yeast biscuits. A little of the yeast made in the manner just described should be made with flour, sugar, and a pinch of salt, into a thick paste, which, when rolled, can be cut into small cakes. These, if dried in the sun on both sides, and afterwards kept in a dry place, will serve the purpose of fresh yeast. Two or three of the biscuits should be dissolved, when needed, in warm water. In baking bread, the oven should be heated to from 400 to 410 degrees. If a little flour dusted on the second shelf turns black instead of a golden brown colour, the oven will be too hot: should the flour be not discoloured, it will not be hot enough.

Cheese.—It seems strange that cheese is so little consumed on English ships. This article of food, which is very nutritious, and takes up very little space amongst the stores, is much used by Scandinavian, Russian, and Italian crews. It need not be always taken uncooked, for it may be served up in many ways: grated with oatmeal; boiled with rice; and also in a pudding of grated cheese and bread crumbs.

Coffee.—Coffee, like tea, should not be boiled. It should be put into the pot with a lump of white sugar, and then covered by boiling water, and cleared with a little cold water.

Cracker or Biscuit Hash.—The biscuit should not be broken up into pieces and soaked over night, as is usually the case. It should be crushed into a fine powder, over which some scalding water should be poured, so that a thick paste is formed. The meat should be chopped into very small pieces, and some onion, pepper and salt, and a little clean fat added. The mess should then be baked in a tin until it has gained a light brown colour.

Fat, how to Clarify.—Cooks often complain that they cannot obtain sufficient fat. This difficulty may be readily overcome by clarifying “slush” from the coppers, instead of throwing it away. The fat should be melted in one sauce-pan and some water heated in another. The fat should then be poured in water (*this must be done gently or an explosion will occur, and the fat be scattered over the stove*) and a small quantity of common washing soda, or two or three drops of oil of vitriol (sulphuric acid) be added. The fat is now boiled in the water and afterwards allowed to get cold before it is removed.

Green Vegetables should be put into boiling water, the lid of the pot being removed, so that the volatile oils which all green vegetables contain may escape with the steam. The unpleasant smell may be removed by laying a slice of bread over the greens. In order to soften the vegetables and to preserve their colour the addition of a little salt and a teaspoonful of brown sugar will be preferable to that of soda.

Ham.—Too often at sea a good ham is spoilt by over-boiling. The ham should be soaked for a time in salt, and afterwards put in cold water, which should then be heated until it boils. After boiling for about fifty minutes the pot should be removed from the fire, the lid being kept on, and the ham allowed to cool in its own water. Thus all the juice will be retained in the meat.

Oatmeal Water.—A quarter of a pound of oatmeal should be boiled with 2 quarts of water, and 1 ounce of sugar added. If taken cold in summer, hot in winter, it will be found a very sustaining drink (*Spooner*).

Pea Soup.—Peas should not be soaked, for the starch in them would then ferment. They should be put on the fire in cold water—not hot. The salt meat should not be added before the peas are well broken; if they do not break when the water is heated do not use soda, but take a rusty bolt from the carpenter’s shop and put it in the pot. When the soup needs to be “spiced” or “thinned down” *boiling water* should be added. If cold, instead of boiling, water be used it will float on the top. Next add some vegetables with a small quantity of celery seed and mint, and at last serve the soup with fried sippets of bread and fried onions cut small.

Porridge.—This is much used on board ship, but seldom properly prepared. The oatmeal, with a little salt added, should be placed in a jar, and boiling water poured over it till a thick paste is formed. This may be done in the afternoon, and the paste, after it has been stirred, should be

put in the oven and "blocked off" there, and left all night. When required on the following day it has only to be warmed. The addition of some crushed malt, or malt flour, will prevent the "feeling of hunger" often complained of by men after taking porridge.

Potato Soup will be found an agreeable change. Cut the potatoes into small pieces, and fry them in a small quantity of clean fat. In the absence of stock add water to the potatoes, and boil, using the same vegetables as for pea soup. If it can be obtained add a little milk; condensed milk will serve the purpose. Mash the potatoes well as they boil, and strain the soup through a sieve before serving.

Rice.—This article of diet is served to the crew with molasses, and as the mixture is not a palatable one is usually wasted. With a little trouble the cook may serve a really good dish by boiling rice dry, then adding a few currants, a little lime-juice, some clean fat, and, if it can be obtained, a small quantity of sugar, and baking the whole in a tin.

Tea.—In making tea the water ought not to boil for more than two minutes before the tea is added. If the water has been boiling for an hour or longer before the tea is added, and the mixture is allowed to stew for another half-hour, the tea when taken will be found rank and bitter. For the cabin the steward should allow one teaspoonful of tea for each person, and an additional spoonful for the pot, add one lump of white sugar, and pour over the tea the full quantity of water just at the point of boiling. The tea thus made should be served at once, and not put on one side to "draw."

RECIPES FOR INVALIDS.

Every ocean-going vessel should have separate cooking utensils reserved for the sick. The expense need not be great, as all that the cook requires would be two or three sauce-pans, one fitted with a steamer (as steamed food is much lighter than boiled or baked for invalids), as also one frying-pan and a kettle.

Apple Water.—Boiling water should be poured over slices of apple, and sugar added. When cool this will be found an agreeable drink.

Arrowroot.—This may be mixed with cold condensed milk if fresh milk cannot be obtained. The mixture should then be poured into hot water, the cook stirring the water all the time to prevent the arrowroot from getting lumpy. He may then flavour with sugar, a little port wine, and nutmeg.

Barley Water.—Let 2 ounces of well-washed barley be poured into a pint and a-half of water, which should then be heated until it boils. The fluid should be strained off, mixed with the same quantity of water, and again boiled until the amount of fluid be reduced to 1 pint. Sugar and lime-juice should then be added, and the barley water strained again before it is served.

Beef Tea.—To make good beef tea the cook should take 1 pound of beef (leg of beef is the best) to 1 pint of water. All the fat having been taken away, the meat should be cut up into very small pieces, and put into a jar to soak for an hour, some salt being added. The jar is afterwards placed in boiling water and kept there for about two hours. As the water outside the jar boils away fresh water should be added. The water within the jar is thus kept simmering at a heat of about 180°. Beef tea should not be heated to a jelly.

Blancmange.—The following will be found a useful recipe:—Mix some

corn flour with a little cold milk, and pour this into some boiling milk or water flavoured with sugar and lime-juice, and let the mixture simmer gently for five minutes, it being stirred all the time. Then pour it into a mould or basin resting in cold water and let it cool.

Boiled Custards.—The cook should take two eggs, three-quarters of a pint of milk, and a small quantity of white sugar. If condensed or watered milk be used a little flour should be added. This should then be heated and poured into a jar placed in boiling water. It should be stirred until it thickens, and then poured into a glass or cup.

Eggs.—To cook an egg for an invalid it should be put into boiling water just removed from the fire, and be allowed to remain there for six or seven minutes. The “white” of the egg will be just “set” and not hardened, and will be much lighter than when boiled in water for the usual three minutes.

Egg Omelettes.—The cook should take two or three eggs, separate the yolks from the whites, and beat them up separately, each in a dry basin. The whites and yolks should next be stirred together and poured into a frying-pan with a little hot fat, and be cooked over the stove for two or three minutes. Then, after the pan has been placed in the oven for another three minutes the omelette may be served up with a little jam or sugar.

Egg and Soda Water.—This agreeable drink may be made by adding a bottle of soda water to the yolk of one egg well beaten up with condensed milk.

Fish.—Let the fish be put into boiling water with a little vinegar and salt. The sauce-pan should then be taken off the fire and the fish allowed to remain in the water for about fifteen minutes. Another way to cook fish for invalids is to place it between two buttered plates and to let it steam for twenty minutes over the top of a sauce-pan.

Jelly.—The cook should take two oranges, two lemons, 3 ounces of loaf sugar, $\frac{1}{2}$ an ounce of gelatine, $\frac{1}{2}$ a pint of cold water. The sugar should first be rubbed on the outside of the oranges and then put into the water, together with the rind (thinly peeled) of the lemons. After the water has been heated to boiling point and then allowed to simmer for half an hour, the juices (not the peel) of the oranges and lemons should be added. Next should be added the white and the shell of one egg, beaten up together, the mixture being stirred. Finally, the gelatine should be added, and the fluid strained through a flannel bag, or a piece of muslin, into a mould or cup. A small glass of sherry may also be added.

Lemonade.—The simplest way to make lemonade is to cut a lemon into five or six slices, put it into a jug with half a dozen lumps of white sugar, and add 1 pint of boiling water: the liquid to be covered and allowed to stand till it is cold. It should be strained before it is served.

Lime-juice drink may be made by adding 2 ounces of lime-juice and $\frac{1}{2}$ an ounce of sugar to $\frac{1}{2}$ a pint of cold water. This will be improved by using aerated instead of plain water, and by adding lumps of ice.

Linseed Tea.—To make this let some whole linseed be put into cold water, which should be heated and allowed to simmer for half an hour, then, after the addition of some sugar, lime-juice, and a little Spanish liquorice, if any be at hand, let the tea be strained and allowed to cool.

Milk should always be scalded by placing the jar or jug which contains it in a sauce-pan of boiling water. When a thick skin forms on the top of the milk it has been sufficiently scalded.

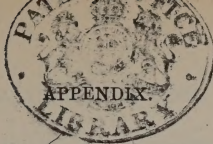
Oatmeal Gruel.—If there be only coarse meal at hand the cook should sift some of this. The fine, or sifted, meal may now be mixed with a little

condensed milk, and this mixture be added to, and stirred up in, boiling water, and boiled for twenty minutes, being carefully stirred all the time. A little sugar and nutmeg should be added before the gruel is served.

Soup should not be allowed to boil, as boiling hardens the albumen which rises to the top and forms a scum which is so much waste. In making soup care should be taken that the sauce-pan is clean and that the meat is well washed. The meat should first be put into cold, not into hot water. When barley is added the soup should simmer for three or four hours. By boiling barley well and for a long time much will be done to prevent diarrhoea, especially in a hot climate.

Stewed Mutton.—All the fat having been cut away the meat should be put into a jar and covered by cold water. The jar should then be placed in a sauce-pan of boiling water, and kept there, the water boiling all the time, for two hours. Vegetables could be added if required.

Toast and Water.—Let the bread be toasted till it is nearly black, and then cold water be poured over it, a little sugar being added.



APPENDIX.

Appendix A.—Prescriptions for Internal Use.

NOTE.—The Reader is requested to bear in mind that all Internal Recipes are referred to by Roman numerals; External Recipes by ordinary figures.

No. I.—Oatmeal Drink.

Oatmeal,	Quarter of a pound.
Brown sugar,	One ounce.
Water,	Two quarts.

Put the oatmeal in the water, which should then be well boiled : afterwards add the sugar. To be taken cold in summer and hot in winter (*Spooners*).

No. II.—Copaiba Mixture.

Copaiba,	Half an ounce (four fluid drams).
Half the Yolk of One Egg.	
Sweet Spirits of Nitre,	Half a fluid ounce (four fluid drams).
Water,	Eight fluid drams.

Dose, two tablespoonfuls.

The copaiba, as it will not mix directly with water, should be stirred or rubbed up in a mortar or basin with the yolk of egg, the water being gradually added. The sweet spirits of nitre should not be added until the last, and when the copaiba and water have been well mixed. The yolk of egg may be replaced by a mixture of gum and water or a solution of carbonate of potash (2 drams to 1 ounce of water).

No. III.—Lime Juice Drink.

Lime Juice,	Two ounces.
Sugar,	Half an ounce.
Water,	Eight ounces.

In special cases a lump of ice, if obtainable, may be added, or aerated water may be used instead of plain water.

No. IV.—Mixture of Quinine and Iron.

Quinine,	Twenty-four grains.
Tincture of Steel,	Two fluid drams.
Water,	Eight fluid ounces.

Dose, two tablespoonfuls.

No. V.—Mixture of Ether and Ipecacuanha.

Powdered Ipecacuanha,	Twelve grains.
Sweet Spirits of Nitre,	Half a fluid ounce.
Water,	Six fluid ounces.

Two tablespoonfuls for a dose.

The mixture should be well shaken before it is given. *Care must be taken to use the simple Ipecacuanha Powder, not the Compound Ipecacuanha or Dover's Powder.*

No. VI.—Mixture of Ammonia and Ether.

Aromatic Spirits of Ammonia,	Half a fluid ounce.
Chloric Ether,	Two fluid drams.
Ipecacuanha Powder,	Sixteen grains.
Water,	Eight fluid ounces.

Dose, two tablespoonfuls.

Simple Ipecacuanha Powder, not Dover's Powder, to be used.

No. VII.—Mixture of Epsom Salts and Bromide of Potassium.

Epsom Salts,	Two ounces.
Bromide of Potassium,	Three drams.
Water,	Eight fluid ounces.

Dose, two tablespoonfuls.

No. VIII.—Mixture of Chlorate of Potash and Epsom Salts.

Chlorate (or Nitrate) of Potash,	One dram.
Epsom Salts,	One ounce.
Water,	Eight fluid ounces.

Dose, two tablespoonfuls.

No. IX.—Mixture of Laudanum and Sweet Spirits of Nitre

Laudanum,	One dram.
Sweet Spirits of Nitre,	Half a fluid ounce.
Water,	Eight fluid ounces.

Dose, two tablespoonfuls.

No. X.—Camphor Draught.

Camphor,	Five grains.
Sweet Spirits of Nitre,	Thirty drops.
Water,	One fluid ounce.

One dose.

No. XI.—Mixture of Epsom Salts and Dover's Powder.

Epsom Salts,	Six drams.
Dover's (Compound Ipecacuanha) Powder,	Half a dram.
Water,	Six fluid ounces.

Two tablespoonfuls for a dose.

No. XII.—Mixture of Iodide of Potassium and Carbolic Acid.

Iodide of Potassium,	Half a dram.
Aromatic Spirits of Ammonia,	One and a-half fluid drams.
Carbolic Acid,	Six drops.
Spirits of Chloroform,	One fluid dram.
Water,	Six fluid ounces.

Two tablespoonfuls for a dose.

Prescriptions for External Applications.

No. 1.—Injection of Carbolic Acid.

Pure Carbolic Acid,	Ten drops.
Water,	Two fluid ounces.

For diseased nose : add one ounce of hot water and use as injection.

No. 2.—Injection of Tincture of Iodine.

Tincture of Iodine,	Ten drops.
Tepid water,	Four fluid ounces.

For diseased nose, to be applied like No. 1 by nasal douche.

No. 3.—Spirit Lotion.

Spirits of Wine,	Two fluid ounces.
Water,	Ten fluid ounces.

No. 4.—Lead and Opium Lotion.

Goulard's Extract,	One fluid dram.
Laudanum,	Half a fluid ounce.
Water,	Ten fluid ounces.

No. 5.—Lead Lotion.

Goulard's Extract,	One dram.
Water,	Ten fluid ounces.

No. 6.—Iodoform Ointment.

Iodoform,	Ten grains.
Vaseline,	One ounce.

No. 7.—Gargle of Condy's Fluid.

Condy's fluid,	One fluid dram.
Water,	Six fluid ounces.

No. 8.—Gargle of Chlorate of Potash.

Chlorate of Potash,	One dram.
Water,	Six fluid ounces.
Glycerine (if at hand),	Half a fluid ounce.

No. 9.—Powder of Zinc, Chalk, and Starch.

Oxide of Zinc,	One ounce.
Powdered Chalk,	Half an ounce.
Starch,	Half an ounce.

No. 10.—Powder of Boracic Acid and Starch.

Boracic Acid,	One ounce.
Powdered Chalk,	One ounce.
Starch,	One ounce.

Appendix B.—Ambulance Classes.

Much has been done to afford facilities to officers and men of the mercantile marine for acquiring instruction in ambulance work and "first aid." The committee of the St. John Ambulance Association have taken great interest in the extension of their valuable instruction to seamen, and modified their course of training to meet the difficulty that pupils of this class are prevented by the conditions of their calling from remaining long in one place. The work in this direction of the St. John Association, and the efforts of owners and masters to take advantage of the opportunities thus afforded them have been so far encouraged by the Board of Trade that an officer's certificate can be indorsed by one testifying a competent knowledge of practical details of such teaching.

The Regulations for the formation of a class may be obtained by communicating with the Chief Secretary of the St. John Ambulance Association, St. John's Gate, Clerkenwell, London, E.C.

The Course of Instruction consists of five lectures, with, in the case of landsmen, an interval of not less than a week between each lecture, and an examination takes place about a week after the last lecture, certificates being awarded to the successful candidates. In seamen's classes, however, the lectures may be given twice instead of once a week, so that the members of a crew may be able to attend a full course whilst their ship is in port.

From twenty-five to thirty is regarded as the best number for a course. If there be more than thirty the instructor cannot devote sufficient time to each pupil, and the expenses will be increased. Each lecture should last about two hours, the last half-hour being devoted to practical work (bandaging, application of splints, &c.).

Syllabus of Instruction on First Aid to the Injured.*

First Lecture.

- A. Preliminary remarks, Objects of Instruction, &c.
- B. A general outline of the Structure and Functions of the Human Body, including a brief description of the Bones, Muscles, Arteries, and Veins. The functions of the Circulation, Respiration, and of the Nervous System.
- C. The Triangular Bandage, and its application.

Second Lecture.

- A. The general direction of the main arteries, indicating the points where the circulation may be arrested by digital pressure, or by the application of the tourniquet.
- B. The difference between Arterial, Venous, and Capillary Bleeding, and the various extemporaneous means of arresting it.
- C. The Triangular Bandage, and its application.

* In the course of a very interesting and instructive lecture read before the members of the Shipmasters' Society, on January 21, 1895, Mr. Alexander M. Cato, M.R.C.S., urged that this course of instruction in "First Aid" should with sailors be supplemented by a description of the simpler methods of rendering what might be called "Second Aid," and that the lecturer might teach, in addition to the first treatment of the various injuries and diseases, the main points to be observed in the further progress of the cases (*Course of Papers, No. 36, Shipmasters' Society, London*).

Third Lecture.

A. The signs of Fracture, and first aid to be rendered in such accidents. The application of Splints, or other restraining apparatus. Treatment of Sprains.

B. The Triangular Bandage, and its application.

Fourth Lecture.

A. First aid to those suffering from collapse from injury, to those stunned, to the apoplectic, inebriated, epileptic, fainting, and to those bitten by rabid animals.

B. The immediate treatment of the apparently drowned, or otherwise suffocated.

C. Burns, scalds, and poisons. What to do when dress catches fire.

Fifth Lecture (For Males Only).

A. The improvised methods of lifting and carrying the sick or injured.

B. Methods of lifting and carrying the sick or injured on stretchers.

C. The conveyance of such by rail or in country carts.

In the classes conducted under the St. Andrew's Ambulance Association, Glasgow,* the instruction is longer and more elaborate, as many as ten lectures being given in each course.

Appendix C.—Tests of Form and Colour Vision.

A set of Rules relating to Form Vision, Colour Vision, and Colour Ignorance Tests has recently† been issued by the Board of Trade as an Appendix to the Regulations relating to the Examinations of Masters and Mates in the Mercantile Marine.

Form Vision, Colour Vision, and Colour Ignorance Tests.

The following are the Rules relating to the Form Vision and Colour Tests :—

1. Examinations for Form Vision, Colour Vision, and Colour Ignorance are open to all persons serving or intending to serve in the Mercantile Marine, and all such persons are recommended to take the earliest opportunity of ascertaining by means of these examinations whether their vision is such as to qualify them for service in that profession.

2. The examination consists of three parts :—

(a) Form Vision Test (*see Note A*).

(b) Colour Vision Test (*see Note B*).

(c) Colour Ignorance Test (*see Note C*).

* 103 West Regent Street, Glasgow.

† September 1, 1894

No candidate will be examined in the Colour Vision Test until he has passed the Form Vision Test, or in the Colour Ignorance Test until he has passed the Colour Vision Test.

3. Any person serving or intending to serve in the Mercantile Marine, if desirous of undergoing the Form Vision, Colour Vision, and Colour Ignorance Tests *only*, must make application to the Superintendent of a Mercantile Marine Office on the Form Exn. 2A, and must pay a fee of One Shilling.

This fee will be payable on each occasion upon which a candidate is examined in Form Vision and Colours *only*.

4. Every candidate for a Certificate of Competency who is not already in possession of such a Certificate will be required to pass the three tests mentioned in Rule 2 before he can proceed to the examination in Navigation and Seamanship for the Certificate which he desires to obtain, even though he may have passed the tests on some previous occasion.

5. Every candidate who is already in possession of a Certificate of Competency, and who desires to obtain a Certificate of a higher grade, will be required to pass the three tests mentioned in Rule 2 before he can proceed to the examination in Navigation and Seamanship for the Certificate of a higher grade.

That is to say, no candidate will be permitted to proceed with the examination in Navigation and Seamanship for a higher Certificate if he fails to pass the three tests.

6. If a candidate fails to pass any of the three tests, a note of the fact of his having done so will be written across the face of the Certificate which he already possesses before the Certificate is returned to him.

7. If a candidate who undergoes the Form Vision, Colour Vision, and Colour Ignorance Tests *only* (see Rule 3) is in possession of a Certificate of Competency, he must hand in his Certificate before the examination commences, and if he fails to pass any of the three tests, a statement of his failure will be written on the Certificate before it is returned to him.

8. Candidates who fail to pass the Form Vision Test or Colour Ignorance Test can be re-examined at intervals of three months, but candidates who fail to pass the Colour Vision Test cannot be re-examined. It is open, however, to any candidate who has failed to pass that test to appeal to the Board of Trade, who may, if they think fit, remit the case to a special examiner or body of examiners for final decision.

9. The expenses of candidates who are examined by the special examiners, and are reported by them to have passed the three tests, will, under certain circumstances, be paid by the Board of Trade, at a rate which will be notified to the candidate, but no payment whatever will be made towards the expenses of candidates who upon their own application are examined by the special examiners and are reported by them to have failed. The special examinations will be held in London only.

10. When a candidate fails to pass the Colour Test the examiner will point out to him the conditions under which he can appeal. Appeals are to be made through the examiner, and forwarded to the Board of Trade with the examiner's remarks.

11. The holder of a Certificate which bears on it a statement of failure in the first test (Form Vision) or in the third test (Colour Ignorance) can have the statement removed by passing after the prescribed interval the test to which it refers, but the instruction in the last paragraph of Rule 2 must be followed.

12. The fee paid for examination for a Certificate of Competency includes

the fee of One Shilling for examination in Form Vision, Colour Vision, and Colour Ignorance, and if the candidate fails to pass those tests, will, with the exception of One Shilling, be returned to him.

13. Only examiners who have themselves passed the Colour Test are to undertake these examinations.

According to the notes appended to these rules :—

A. The test to be used for *Form Vision* are Snellen's letter test for candidates who can read, and the "dot" tests for those who cannot read. The chief object of these tests is to show whether the candidate possesses eyesight of sufficient strength and range, or, in other words, they are means of discovering whether the candidate has good or bad sight. They also afford a means of detecting whether a candidate is suffering from that form of colour blindness which is caused by the excessive use of tobacco, and by illness or similar affections.

B. The *Colour Vision* is to be tested by Holmgren's method, which consists in asking the candidate to select from variously coloured skeins of wool those which appear of the same colour as one selected by the examiner. Elaborate instructions are given for properly applying this method of examination.

C. The *Colour Ignorance Test* is simply to ascertain whether the candidate knows the names of the three colours—red, green, and white. The candidate is required to name the colours of one or two of the purest red and green skeins of wool, and also the colour of any white object, such as a piece of white paper.

D. Ports at which Examinations in Form Vision, Colour Vision, and Colour Ignorance take place.

Aberdeen.—Every Monday, by the Examiner of Masters and Mates.

Belfast.—Every Saturday morning from 10 to 12 o'clock, by the Examiner of Masters and Mates.

Bristol.—Monday in Examination week,* by the Examiner of Masters and Mates.

Cardiff.—Any day, by the Principal Officer of the Board of Trade, Monday in Examination week, by the Examiner of Masters and Mates.

Cork.—Any day, by the Examiner of Masters and Mates.

Dublin.—Monday in Examination week, by the Examiner of Masters and Mates.

Dundee.—Every Friday, Saturday, and Monday preceding the Examination of Masters and Mates, by the Superintendent of the Mercantile Marine Office.

Glasgow.—Monday in Examination week, by the Examiner of Masters and Mates.

Greenock.—Monday in Examination week, by the Examiner of Masters and Mates.

Hartlepool, West.—Wednesday or Thursday in Examination Week, by the Examiner of Masters and Mates.

Hull.—Any day, by the Principal Officer of the Board of Trade, Saturday preceding the Examination of Masters and Mates, by the Examiner of Masters and Mates.

Leith.—Any day by the Superintendent of the Mercantile Marine Office.

Liverpool.—Every Friday and Saturday, by the Examiner of Masters and Mates.

* *i.e.*, the week in which Masters' and Mates' Examinations take place. See Appendix A. of the Regulations relating to the Examinations of Masters and Mates.

London.—Every Friday and Saturday, by the Examiner of Masters and Mates.

Newport.—Monday in Examination week by the Examiner of Masters and Mates.

North Shields.—Second and fourth Tuesday in each month, by the Principal Officer of the Board of Trade.

Plymouth.—Every Saturday, by the Examiner of Masters and Mates.

Southampton.—Wednesday in Examination week, by the Superintendent of the Mercantile Marine Office.

South Shields.—Monday in Examination week, by the Examiner of Masters and Mates.

Sunderland.—Monday in Examination week, by the Examiner of Masters and Mates.

Swansea.—Any day, by the Board of Trade Officer. Monday in Examination week, by the Examiner of Masters and Mates.

Appendix D.—Suggested List of "Tabloids" (Burroughs, Wellcome & Co.), &c., for Yacht Case.

For Internal Use.—1. Aloin Compound. 2. Antipyrin, 5 grains. 3. Bismuth and Soda. 4. Caffeine Citrate. 5. Cascara Sagrada. 6. Calcium Sulphide, $\frac{1}{10}$ grain (small bottle). 7. Chloral Amid. and Ammon. Brom. 8. Compound Rhubarb Pill. 9. Dover Powder, 5 grains. 10. Easton's Syrup. 11. Essence of Ginger, 5 m. 12. Gelsem. Tinct., 5 m. 13. Grey Powder (Hyd. c. Creta.), 1 grain. 14. Gregory Powder (Pulv. Rhei. Co.), 5 grains. 15. Ipecac. Powder, 5 grains. 16. Lithia Co. 17. Peptonic (new formula). 18. Potassium Bromide, 5 grains. 19. Potassium Iodide, 5 grains. 20. Quinine, 2 grains (sugar-coated). 21. Saccharin, $\frac{1}{2}$ grain. 22. Soda Bicarbonate. 23. Soda Salicylate, 5 grains. 24. Soda Mint. 25. Zinc Sulphate, 10 grains. 26. Voice "Tabloids." 27. Chlorodyne.

For External Application.—1. Permanganate of Potash. 2. "Hazeline" Cream. 3. Zinc Ointment. 4. Resin Ointment.

Lint, Cotton Bandages, Mustard Poultices (Sacklin), Ligature, Wool, Adhesive Plaster, Minim Measure (in case), Tourniquet, Bandages (Calico), Court Plaster, Clinical Thermometer, Needles, Medical and Surgical Guide Book.

For Internal Use.

1. Aloin Compound.—A useful preparation in cases of chronic and obstinate constipation. Dose 1 or 2 tabloids. Taken at bedtime or fasting in the morning will act as a mild but efficient purgative.

2. Antipyrin (5 grains in each tabloid).—This quickly lowers the temperature in feverish conditions, and is most effective in small and repeated doses. It is useful also in cases of neuralgia and frontal headache. It may be given in doses of 5 or 10 grains (1 or 2 tabloids) every two hours, until 30 grains have been taken, unless the pain has been relieved.

3. Bismuth and Soda ($2\frac{1}{2}$ grains of each in 1 tabloid).—Useful in acidity of the stomach giving rise to indigestion. Dose 2 to 4 tabloids, to be taken with a draught of water.

4. Caffeine Citrate (2 grains in each tabloid).—This is a good stimulant (dose 2 to 4 tabloids), and combined with antipyrin (2 tabloids of caffeine with 2 of antipyrin) a useful remedy in cases of neuralgic headache.

5. *Cascara Sagrada* (1 tabloid contains 20 drops of liquid extract).—An excellent laxative. Dose 2 tabloids, to be taken fasting.

6. *Sulphide of Calcium* ($\frac{1}{10}$ th grain in 1 tabloid).—A useful remedy for boils. Dose 1 or 2 tabloids.

7. *Chloralamid and Bromide of Ammonium*.—Has been found useful in relieving sickness. When the attack is felt to be coming on the patient should take 1 or 2 tabloids and rest in a recumbent position.

8. *Compound Rhubarb Pill*.—A mild purgative. Dose 1 to 3 tabloids.

9. *Dover's Powder* (5 grains in each tabloid).—This preparation is included in the scale of medicines. (See p. 34.)

10. *Easton's Syrup* (1 tabloid contains 1 dram of the syrup).—This, which contains quinine, iron, and strychnia, is a valuable tonic. Dose not to exceed a *single* tabloid.

11. *Essence of Ginger* (5 drops in each tabloid).—See p. 32.

12. *Tincture of Gelsemium* (5 minims in each tabloid).—Useful in cases of neuralgia and nervous excitability, but must be *given with great care*. Dose 1 to 2 tabloids.

13. *Mercury and Chalk* (Grey Powder, 1 grain in each tabloid).—A good aperient in cases of sluggish liver. Dose 1 to 4 tabloids.

14. *Compound Rhubarb Powder* (Gregory's Powder).—Acts as a mild aperient. Dose 1 to 4 tabloids.

15. *Ipecacuanha Powder* (5 grains in each tabloid).—Dose, as an emetic, 4 tabloids; in cases of dysentery, 1 or 2 tabloids. (See p. 34.)

16. *Lithia Compound*.—For gout and rheumatism. Dose 4 or 5 tabloids, to be taken in the morning fasting with a draught of water.

17. *Peptonic Tabloids*.—Contain pepsin and pancreatin; are useful in many cases of dyspepsia and flatulence. Dose 1 or 2 tabloids after each meal.

18. *Bromide of Potassium* (5 grains in each tabloid).—Dose 2 to 6 tabloids. (See p. 31.)

19. *Iodide of Potassium* (5 grains in each tabloid).—See p. 32.

20. *Quinine* (2 grains in each tabloid).—See p. 34.

21. *Saccharin* ($\frac{1}{2}$ grain in each tabloid).—For sweetening tea or coffee, 1 tabloid being sufficient for an ordinary cupful.

22. *Bicarbonate of Soda* (5 grains in each tabloid).—See p. 31.

23. *Salicylate of Soda* (5 grains in each tabloid).—Useful in cases of fever and of acute rheumatism. Dose 1 to 3 tabloids.

24. *Soda Mint*.—A combination of bicarbonate of soda and essence of peppermint. For correcting acidity and heartburn. Dose 1 or 2 tabloids.

25. *Sulphate of Zinc* (10 grains in each tabloid).—Dose, as an emetic in cases of poisoning, half a dram (3 tabloids) to 1 dram (6 tabloids). See p. 34.

26. *Voice Tabloids*, containing chlorate of potash, borax, and cocaine. One tabloid to be slowly dissolved in the mouth in cases of hoarseness.

27. *Chlorodyne*.—See p. 35.

For External Use.

1. *Permanganate of Potash* (5 grains in each tabloid).—For preparing antiseptic lotions (2 tabloids to half pint of water), injections (1 tabloid to half pint), and gargles (1 tabloid to 2 pints).

2. *Hazeline Cream*.—A soothing and emollient application to tender and inflamed skin, and also a useful antiseptic application to small and superficial wounds, burns, and scalds.

3. *Zinc Ointment*.

4. *Resin (Basilicon) Ointment*.—See p. 37.

Appendix E.—Diet Scales.

No. 1.—Scale in Ordinary Use on British Vessels.

Scale of Provisions to be allowed and served out to the Crew during the Voyage, in addition to the daily issue of Lime and Lemon Juice and Sugar, or other antiscorbutics in any case required by 30th and 31st Vict., c. 124, s. 4.

	Bread.	Beef.	Pork.	Tinned Meats.	Soup and Bouilli.	Preserved Potatoes.	Compressed or Preserved Vegetables.	Flour.	Peas.	Rice.	Tea.	Coffee.	Sugar.	Molasses.	Water.
Sunday, .	lb. 1	lb. 1½	lb. ...	lb. ...	pint. ...	lb. ...	lb. ...	lb. ½	pint. ...	lb. ...	oz. ⅙	oz. ¼	oz. 2	oz. ...	qts. 3
Monday, .	1	...	1¼	...	...	...	...	...	½	...	⅙	½	2	...	3
Tuesday, .	1	1½	...	...	...	...	...	½	...	...	⅙	½	2	...	3
Wednesday, .	1	...	1¼	...	...	...	...	...	⅙	...	⅙	½	2	...	3
Thursday, .	1	1½	...	...	...	...	...	½	...	...	⅙	½	2	...	3
Friday, .	1	...	1¼	...	...	...	...	...	½	...	⅙	½	2	...	3
Saturday, .	1	1½	...	...	...	...	...	...	...	½	⅙	½	2	...	3

Note.—In any case, an equal quantity of Fresh Meat or Fresh Vegetables may, at the option of the Master, be served out in lieu of the Salted or Tinned Meats, or Preserved or Compressed Vegetables named in the above scale.
Substitutes.—Equivalent substitutes at the Master's option.

No. 2.—Proposed Victualling Scale to be served out to the Crew per day, in addition to the issue of lime juice and sugar required by law. (By Mr. Spooner.)

	Coffee.	Tea.	Pickles.	Suet.	Molasses.	Raisins.	Sugar.	Marmalade.	Rice.	Oatmeal.	Butter.	Preserved Carrots.	Preserved Potatoes.	Peas.	Preserved Meat.	Pork.	Beef.	Flour.	Biscuit.
Sunday, . .	oz. 1	$\frac{1}{8}$					2		...	...	2	8	...	$\frac{1}{3}$ pt.	oz. 12	oz. ...	lb. ...	8	oz. 12
Monday, . .	1	$\frac{1}{8}$	4 oz. per week.	4 oz. per week.			2	1 lb. per week.	...	4	...	...	2	...	...	...	1	...	12
Tuesday, . .	1	$\frac{1}{8}$					2		...	...	...	8	...	...	12	...	...	8	12
Wednesday, .	1	$\frac{1}{8}$					2		4	...	2	...	2	$\frac{1}{3}$	...	12	...	8	12
Thursday, .	1	$\frac{1}{8}$					2		...	4	...	8	...	...	12	...	...	...	12
Friday, . .	1	$\frac{1}{8}$					2		...	...	2	...	2	...	...	...	1	8	12
Saturday, .	1	$\frac{1}{8}$					2		4	...	...	...	2	$\frac{1}{3}$	...	12	...	8	12
One man per week, }	7	1 oz.	4 oz.	4 oz.	$\frac{1}{2}$ pt.	8 oz.	14	1	8	8	6	1·8	8	1 pt.	2·4	1·8	2·0	2·8	5·4

Substitutes.

Fresh meat to be given instead of salt, and preserved as long as possible after leaving port.

Fresh potatoes, carrots, &c., $3\frac{1}{2}$ lbs. per week, instead of preserved vegetables, as long as they last.

Oatmeal may be substituted for rice in cold weather, and *vice versa* in hot weather.

Preserved onions may be substituted for preserved carrots.

No. 3.—Scale of Provisions drawn up by the Mercantile Marine Committee, 1902, and recommended by the Board of Trade.

	Soft Bread.	Biscuit.	Salt Beef.	Salt Pork.	Preserved Meat.	Potatoes or Yams.	Preserved Vegetables.	Flour.	Peas, Split.	Peas, Green.	Haricot Beans.	Rice.	Oatmeal.	Tea.	Coffee.	Cocoa.	Sugar.	Butter.	Marmalade.	Jam.	Syrup.	Fish, dry, preserved, or fresh.	Milk, Condensed.	Suet.	Pickles.	Tomatoes, tinned or fresh.	Bacon.	Water.
Sunday, .	lb. 1	.. 1	lb. ½	lb. 1	lb. ¾	lb. 1	lb. 1	lb. ½	oz. 3	oz. 3	oz. 3	lb. ½	oz. 2	oz. 1½	oz. 2	oz. 2	lb. 1½	lb. ½	lb. ½	lb. ½	lb. ½	lb. ½	lb. ½	lb. ½	oz. 4	pt. ½	lb. ½	qts. 28
Monday, .	.. 1	.. 1	.. 1	.. 1	.. 1	.. 1	.. 1	.. 1	.. 3	.. 3	.. 3	.. ½	.. 2	.. 2	.. 2	.. 2	.. 1½	.. ½	.. ½	.. ½	.. ½	.. ½	.. ½	.. ½	.. 4	.. 4	.. 4	.. 4
Tuesday, .	1	.. 1	1½	.. 1	.. 1	1	1	1½	.. 3	.. 3	.. 3	.. ½	2	.. 2	.. 2	.. 2	1½	½	½	½	½	½	½	½	4	4	4	4
Wednesday, .	.. 1	.. 1	.. 1	.. 1	.. 1	1	1	1½	.. 3	.. 3	.. 3	.. ½	2	.. 2	.. 2	.. 2	1½	½	½	½	½	½	½	½	4	4	4	4
Thursday, .	1	.. 1	.. 1	.. 1	.. 1	1	1	1½	.. 3	.. 3	.. 3	.. ½	2	.. 2	.. 2	.. 2	1½	½	½	½	½	½	½	½	4	4	4	4
Friday, .	.. 1	.. 1	.. 1	.. 1	.. 1	1	1	1½	.. 3	.. 3	.. 3	.. ½	2	.. 2	.. 2	.. 2	1½	½	½	½	½	½	½	½	4	4	4	4
Saturday, .	1, .	.. 1	1½	.. 1	.. 1	1	1	1½	.. 3	.. 3	.. 3	.. ½	2	.. 2	.. 2	.. 2	1½	½	½	½	½	½	½	½	4	4	4	4
Weekly, .	4	3	3	2	2½	7	½	2	6	3	6	½	4	1½	2	2	1½	½	½	½	½	½	½	½	4	½	8	½

Raisins 1 oz., currants 1 oz., dried figs 1 oz., apple rings 1 oz., weekly.

Fine salt 2 oz., mustard ¼ oz., pepper ¼ oz., chicory ½ oz., curry powder ¾ oz., and onions 3 oz., weekly.

In harbour soft bread is always to be issued.

Within the tropics 1½ lbs. preserved meat, or 3 lbs. fresh meat, is to be substituted for the 2 lbs. salt pork.

In sailing ships after six weeks from home ports 1 lb. preserved potatoes may be substituted for 7 lbs. fresh potatoes.

Fresh vegetables may be substituted in the proportion of ½ lb. to the ounce of preserved vegetables.

Stokehold hands to receive oatmeal and 1 quart water extra daily while under steam.

Substitutes and Equivalents—not to be used without reasonable cause.

Fresh meat, . . . 1½ lb. } To be Salt meat, . . . 1 lb. } considered Preserved meat, ¾ lb. } equal. Coffee, . . . ½ oz. } Cocoa, . . . ½ oz. } Do. Tea, . . . 1 oz. } Flour, . . . 1 lb. } Biscuit, . . . 1 lb. } Do. Rice, . . . 1 lb. } In port 1½ lbs. fresh meat and ½ lb. fresh vegetables daily in lieu of salt and preserved meat and preserved vegetables whenever procurable at prices not excessive.	Split peas, . . . 6 oz. } When issued Flour, . . . 12 oz. } with meat Haricot beans, 8 oz. } rations. Rice, . . . 12 oz. } In equal quantities. Currants, . . . Dried figs, . . . Apple rings, . . . Marmalade, . . . 8 oz. } To be con- Jam, . . . 6 oz. } sidered equal.
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NOTE.—If this Scale is not adopted it should be detached, and the Master should then have a statement of the quantity and nature of the provisions which it may be agreed to furnish to each seaman day by day inserted in the vacant space.

No. 4.—Scale suggested by the Shipping Federation.

Scale of Provisions to be allowed and served out to the Crew during the Voyage, in addition to the daily issue of Lime and Lemon Juice and Sugar, and other anti-scorbutics, in any case required by 30th and 31st Vict., cap. 124, s. 4.

Vinegar or Pickles.	pt.	...	...	...	...	...	...	...	...	WEEKLY STORES.	1	1
Chicory.	oz.	...	...	...	...	...	...	...	...		1	1
Pepper.	oz.	...	...	...	...	...	...	...	...		1	1
Mustard.	oz.	...	...	...	...	...	...	...	...		1	1
Molasses.	pt.	...	...	...	...	...	...	...	...		1	1
Marmalade and Jam.	lb.	...	...	...	...	...	...	...	...		1	1
Butter.	lb.	...	...	...	...	...	...	...	...		1	1
Dried Fruit.	oz.	...	...	...	...	...	...	...	...		3	3
Sugar.	oz.	...	...	...	...	...	...	...	...		14	14
Coffee Beans (roasted).	oz.	...	...	...	...	...	...	...	...		3 1/2	3 1/2
Tea.	oz.	...	...	...	...	...	...	...	...		1 3/4	1 3/4
Oatmeal.	lb.	...	...	...	1 1/2	...	...	...	1 1/2		1 1/2	1 1/2
Rice.	lb.	...	...	1 1/2	...	...	...	...	1 1/2		1 1/2	1 1/2
Calavances.	pt.	...	1 1/2	...	...	1 1/2	...	...	...	1 1/2	1 1/2	
Peas.	pt.	...	1 1/2	...	...	1 1/2	...	...	...	2 3/4	2 3/4	
Flour.	lb.	1 1/2	...	1 1/2	1 1/2	...	...	...	1 1/2	2	2	
Preserved Vegetables.	lb.	...	...	...	1 1/2	...	1 1/2	...	...	1 1/2	1 1/2	
Preserved Potatoes.	oz.	...	2	...	...	2	...	...	2	6	6	
Preserved Meats.	lb.	3 1/2	...	...	3 1/2	...	3 1/2	...	...	2 1/2	2 1/2	
Pork.	lb.	...	1	...	...	1	...	...	...	2	2	
Beef.	lb.	1 1/2	...	1	...	...	...	...	1	2 1/2	2 1/2	
Bread.	lb	1	1	1	1	1	1	1	1	7	7	
Water.	qts.	4	4	4	4	4	4	4	4	28	28	
Sunday,	.	.	.	.	.	.	.	.	.	.	.	.
Monday,	.	.	.	.	.	.	.	.	.	.	.	.
Tuesday,	.	.	.	.	.	.	.	.	.	.	.	.
Wednesday,	.	.	.	.	.	.	.	.	.	.	.	.
Thursday,	.	.	.	.	.	.	.	.	.	.	.	.
Friday,	.	.	.	.	.	.	.	.	.	.	.	.
Saturday,	.	.	.	.	.	.	.	.	.	.	.	.
Weekly,	.	.	.	.	.	.	.	.	.	.	.	.

WEEKLY STORES.

Fresh potatoes or vegetables, 1 lb. daily (as long as supply lasts), may be issued instead of preserved potatoes and vegetables.

Within the tropics, $1\frac{1}{2}$ lbs. marmalade may be issued weekly instead of $\frac{1}{2}$ lb. butter and 1 lb. marmalade. In cold weather, $\frac{3}{4}$ lb. of butter may be issued instead of $\frac{1}{2}$ lb. butter and 1 lb. marmalade.

Bread to be issued as required, enough without waste. Stoke-hole hands to receive oatmeal and 1 quart of water extra daily while under steam.

Substitutes and Equivalents.

	Fresh meat, . . .	$1\frac{1}{2}$ lbs.	} are to be considered equal to each other.
	Salt meat, . . .	1 lb.	
	Preserved meat, . . .	$\frac{3}{4}$ lb.	
	Salt fish, . . .	$1\frac{1}{2}$ lbs.	
	Coffee, . . .	$\frac{1}{2}$ oz.	} " " "
	Cocoa, . . .	$\frac{1}{2}$ oz.	
	Tea, . . .	$\frac{1}{4}$ oz.	
	Biscuit, . . .	1 lb.	} " " "
	Flour, . . .	1 lb.	
	Rice, . . .	1 lb.	
1.	{ Split peas, . . .	$\frac{1}{3}$ pt.	} when issued with meat rations.
	{ Flour, . . .	$\frac{3}{4}$ lb.	
	{ Calavances, . . .	$\frac{1}{3}$ pt.	
	{ Rice, . . .	$\frac{3}{4}$ lb.	
2.	{ Vegetables (fresh), . . .	$\frac{1}{2}$ lb.	
	{ Compressed mixed vegetables, . . .	1 oz.	
	{ Preserved potatoes, . . .	2 ozs.	
3.	{ Mustard, . . .	$\frac{1}{4}$ oz.	
	{ Curry powder, . . .	$\frac{1}{4}$ oz.	

In port, $1\frac{1}{2}$ lbs. fresh meat and $\frac{1}{2}$ lb. fresh vegetables in lieu of salt meat and preserved vegetables, whenever procurable; bread, flour, and weekly stores as per scale.

Appendix F.

Sections of Merchant Shipping Act (1894) relating to Provisions, Health, and Accommodation on board Ship.

Regulations respecting Medicines, Anti-scorbutics, &c. Section 200.—(1) The Board of Trade shall issue scales of medicines and medical stores suitable for different classes of ships and voyages, and shall also prepare or sanction books containing instructions for dispensing the same.

(2) The owner of every ship navigating between the United Kingdom and any place out of the same shall provide and cause to be kept on board a supply of medicine and medical stores according to the scale appropriate to the ship, and also the said books or one of them.

(3) The master or owner of every such ship, except in the case of--

(a) Ships bound to European ports or ports in the Mediterranean Sea; and

(b) Such ships or classes of ships bound to ports on the Eastern coast of America north of the thirty-fifth degree of north latitude, and to any islands or places in the Atlantic Ocean north of the same limit, as the Board of Trade may except;

Shall provide and cause to be kept on board a sufficient quantity of anti-scorbutics, in accordance with the regulations in the fifth schedule to this Act, and those regulations shall have effect as part of this section, and the master shall serve out the anti-scorbutics to the crew according to the said regulations; and if a seaman or apprentice refuses or neglects to take the anti-scorbutics when served out, that fact shall be entered in the official log-book, and the entry shall be signed by the master and by the mate or some other of the crew, and also by the medical practitioner on board, if any.

(4) If any requirement of this section with respect to the provision of medicines, medical stores, book of instruction, or anti-scorbutics, is not complied with in the case of any ship, the owner or master of that ship shall, for each offence, be liable to a fine not exceeding twenty pounds, unless he can prove that the non-compliance was not caused through his inattention, neglect, or wilful default.

(5) If any requirement of this section with respect to the serving out of anti-scorbutics or making an entry in the official log-book is not complied with in the case of any ship to which the requirement applies, the master of the ship shall, for each offence, be liable to a fine not exceeding five pounds, unless he can prove that the non-compliance did not arise through any neglect, omission, or wilful default on his part.

(6) If it is proved that some person, other than the master or owner, is in default in any case under this section, that person shall, for each offence, be liable to a fine not exceeding twenty pounds.

(7) If any person manufactures, sells, or keeps, or offers for sale any medicines or medical stores for use on board ship which are of bad quality, he shall, for each offence, be liable to a fine not exceeding twenty pounds.

Section 201.—(1) The master of a ship shall keep on board proper weights and measures for determining the quantities of the several provisions and articles served out, and shall allow the same to be used at the time of serving out the provisions and articles in the presence of a witness whenever any dispute arises about the quantity.

(2) If the master of a ship fails, without reasonable cause, to comply with this section, he shall, for each offence, be liable to a fine not exceeding ten pounds.

Section 202.—(1) It shall be the duty of the medical inspector of ships for the port appointed under this part of this Act to inspect the medicines, medical stores, and anti-scorbutics with which a ship is required by this part of this Act to be provided.

(2) For the purpose of that inspection a medical inspector of

Weights
and
Measures
on board.

Inspection
of
Medicines,
Medical
Stores, and
Anti-scor-
butics.

ships shall have all the powers of a Board of Trade inspector under this Act, and shall act, if appointed by a Local Marine Board, under the direction of that Board (except in special cases in which the Board of Trade require an inspection to be made), and if appointed by the Board of Trade, under the direction of the Board of Trade.

(3) The medical inspector of ships shall make his inspection three clear days at least before the ship proceeds to sea, if reasonable notice in writing for the purpose is given to him by the master, owner, or consignee, and, where the result of the inspection is satisfactory, shall not make another inspection before the ship proceeds to sea, unless he has reason to suspect that any of the articles inspected have been subsequently removed, injured, or destroyed.

(4) If the medical inspector of ships is of opinion that the articles inspected are deficient in quantity or quality, or are placed in improper vessels, he shall give notice in writing to the chief officer of customs of the port where the ship is lying, and also to the master, owner, or consignee thereof; and the master of the ship, before proceeding to sea, shall produce to the chief officer of customs a certificate under the hand of the same or some other medical inspector of ships, that the default found by the inspector has been remedied; and if that certificate is not so produced, the ship shall be detained until the certificate is produced, and if the ship proceeds to sea, the owner, master, or consignee of the ship shall, for each offence, be liable to a fine not exceeding twenty pounds.

Medical
Inspection
of Seamen.

Section 203.—(1) A medical inspector of seamen appointed under this part of this Act shall, on application by the owner or master of any ship, examine any seaman applying for employment in that ship, and give to the superintendent a report under his hand stating whether the seaman is in a fit state for duty at sea, and a copy of the report shall be given to the master or owner.

(2) The applicant for that medical examination shall pay to the superintendent such fees as the Board of Trade direct, and those fees shall be paid into the Mercantile Marine Fund.

Appoint-
ment of
Medical
Inspectors.

Section 204.—(1) The Local Marine Board at a port may, upon being required by the Board of Trade to do so, appoint and remove a medical inspector of ships for the port, and, subject to the control of the Board of Trade, may fix his remuneration, and at any port where there is no Local Marine Board, the Board of Trade may appoint and remove a medical inspector of ships, and may fix his remuneration.

(2) The Local Marine Board and at a port where there is no Local Marine Board the Board of Trade, may appoint and remove a medical inspector of seamen, and that inspector shall be paid out of the Mercantile Marine Fund such remuneration as the Board of Trade direct.

Certain
Ships to
carry
Medical
Practition-
ers.

Section 209.—(1) Every foreign-going ship having one hundred persons or upwards on board shall carry on board as part of her complement some duly qualified medical practitioner, and if she does not the owner shall, for every voyage of the ship made without a duly qualified medical practitioner, be liable to a fine not exceeding one hundred pounds.

(2) Nothing in this section shall apply to an emigrant ship within the meaning of the third part of this Act.

Section 210.—(1) Every place in any British ship occupied by seamen or apprentices, and appropriated to their use, shall have for each of those seamen or apprentices a space of not less than 72 cubic feet and not less than 12 superficial feet measured on the deck or floor of that place, and shall be subject to the regulations in the sixth schedule to this Act, and those regulations shall have effect as part of this section; and if any of the foregoing requirements of this section is not complied with in the case of any ship, the owner of the ship shall, for each offence, be liable to a fine not exceeding twenty pounds.

(2) Every place so occupied and appropriated shall be kept free from goods and stores of any kind not being the personal property of the crew in use during the voyage, and if any such place is not so kept free, the master shall forfeit and pay to each seaman or apprentice lodged in that place the sum of one shilling for each day during which, after complaint has been made to him by any two or more of the seamen so lodged, it is not so kept free.

Section 300.—(1) The owner or charterer of every emigrant ship shall provide for the use of the steerage passengers a supply of the following things (in this part of this Act referred to as medical stores)—namely, medicines, medical comforts, instruments, disinfectants, and other things proper and necessary for diseases and accidents incident to sea voyage, and for the medical treatment of the steerage passengers during the voyage, with written directions for the use of such medical stores.

(2) The medical stores shall, in the judgment of the emigration officer at the port of clearance, be good in quality and sufficient in quantity for the probable exigencies of the intended voyage, and shall be properly packed and placed under the charge of the medical practitioner, when there is one on board, to be used at his discretion.

(3) If any of the above requirements of this section is not complied with in the case of an emigrant ship, the master of the ship shall, for each offence, be liable to a fine not exceeding fifty pounds.

(4) An emigrant ship shall not clear outwards or proceed to sea unless a medical practitioner appointed by the emigration officer at the port of clearance has inspected the said medical stores and certified to the emigration officer that they are sufficient in quantity and quality, or unless the emigration officer, in case he cannot on any particular occasion obtain the attendance of a medical practitioner, gives written permission for the purpose.

(5) If an emigrant ship clears outwards or proceeds to sea without such a certificate or permission, the master of the ship shall for each offence be liable to a fine not exceeding one hundred pounds.

Section 303.—(1) Subject to any regulations made by Order in Council under this part of this Act, a duly authorised medical practitioner shall be carried on board an emigrant ship—

(a) Where the number of steerage passengers on board exceeds fifty; and also

Accommodation for Seamen.

Medical Stores.

Medical Officer, Staff, and Crew.

(b) Where the number of persons on board (including cabin passengers, officers, and crew) exceeds three hundred.

(2) A medical practitioner shall not be considered to be duly authorised for the purposes of this Act unless—

(a) He is authorised by law to practise as a legally qualified medical practitioner in some part of Her Majesty's dominions, or, in the case of a foreign ship, in the country to which that ship belongs; and

(b) His name has been notified to the emigration officer at the port of clearance, and has not been objected to by him; and

(c) He is provided with proper surgical instruments to the satisfaction of that officer.

(3) When the majority of the steerage passengers in any emigrant ship, or as many as three hundred of them, are foreigners, any medical practitioner, whether authorised or not, may, if approved by the emigration officer, be carried therein.

(4) Where a medical practitioner is carried on board an emigrant ship, he shall be rated on the ship's articles.

(5) If any requirement of this section is not complied with in the case of any emigrant ship, the master of the ship shall for each offence be liable to a fine not exceeding one hundred pounds.

(6) If any person proceeds or attempts to proceed as medical practitioner in any emigrant ship without being duly authorised, or contrary to the requirements of this section, that person and any person aiding and abetting him shall for each offence be liable to a fine not exceeding one hundred pounds.

Medical
Inspection
of Steerage
Passengers
and Crew.

Section 306.—(1) An emigrant ship shall not clear outwards or proceed to sea until—

(a) Either a medical practitioner, appointed by the emigration officer at the port of clearance, has inspected all the steerage passengers and crew about to proceed in the ship, and has certified to the emigration officer, and that officer is satisfied, that none of the steerage passengers or crew appear to be, by reason of any bodily or mental disease unfit to proceed, or likely to endanger the health or safety of the other persons about to proceed in the ship; or

(b) The emigration officer, if he cannot on any particular occasion obtain the attendance of a medical practitioner, grants written permission for the purpose.

(2) The inspection shall take place either on board the ship or, in the discretion of the emigration officer, at such convenient place on shore before embarkation as he appoints, and the master, owner, or charterer of the ship shall pay to the emigration officer in respect of the inspection such fee not exceeding twenty shillings for every hundred persons or fraction of a hundred persons inspected as the Board of Trade determine.

(3) If this section is not complied with in the case of any emigrant ship, the master of the ship shall for each offence be liable to a fine not exceeding one hundred pounds.

Appendix G.—Port Sanitation : Cholera Regulations.

The Public Health Act of 1875 (Section 110) provides that as regards nuisances “any ship or vessel, except those of British or foreign Governments, lying in any river, harbour, or other water, within the district of a local authority, shall be subject to the jurisdiction of that authority in the same manner as if it were a house.”

In 1885 it was provided that this Section should have effect also for the purposes of the provisions of the Act relating to infectious diseases and hospitals.

In certain Orders, in 1883, and an Order in 1884, Rules and Regulations were prescribed by the Local Government Board to Port Sanitary Authorities, with a view to the treatment of persons affected with cholera, and for preventing the spread of the disease.

In 1890 fresh Regulations (Cholera Regulations, Ports, August 28, 1890) were issued as to detention of an infected ship, or of one in which infection is suspected, by Officers of Customs, and as to the action in such cases of Port Sanitary Authorities.

For the purposes of this Order “every ship shall be deemed infected with cholera, in which there is or has been during the voyage or during the stay of such ship in a port in the course of such voyage, any case of cholera.

“On the arrival of any ship affected with cholera or suspected to be so, any officer of customs shall detain the same, order it to be moored in such position as he shall direct, and forthwith give notice to the Port Sanitary Authority. No person shall leave the ship whilst so detained.

“Detention ceases if the Port Medical Officer finds the ship free from infection, or if the examination be not commenced within twelve hours after notice given by the Officer of Customs.

“The Medical Officer of Health, if he have reason to believe that any ship coming or being within the jurisdiction or district of his Sanitary Authority, whether examined by the Officer of Customs or not, is infected with cholera, shall, or if she have come from a place infected with cholera, may, visit and examine such ship, for the purpose of ascertaining whether she is so infected; and the master of such ship shall permit the same to be so visited and examined. If the Medical Officer of Health find the ship infected, he shall, after certifying the same to the master of the ship, fix, with the approval of the Chief Officer of Customs of the port, some place where the ship may be moored. The master of the ship so certified to be infected with cholera shall thereupon moor or anchor her at the place thus fixed, and she shall remain there until the requirements of the order have been duly fulfilled.

“The Medical Officer of Health shall then examine every person on board the ship. Every person certified to be suffering from cholera shall be removed, if his condition admit of it, to some hospital or other suitable place appointed for that purpose by the Sanitary Authority. If any person suffering from cholera cannot be removed, the ship shall remain subject, for the purposes of the Order, to the control of the Medical Officer of Health, and the infected person shall not be removed from or leave the ship, except with the consent in writing of the Medical Officer of Health.

“Any person certified by the Medical Officer of Health to be suffering from any illness which is suspected to be cholera, may either be detained on board the ship for any period not exceeding two days, or be taken to

some hospital or other suitable place appointed for that purpose by the Sanitary Authority, and detained there, for a like period.

"Any person not certified to be suffering from cholera or any illness which the Medical Officer of Health suspects may be cholera, shall be permitted to land on giving his name and place of destination, stating, where practicable, his address at such place.

"The Medical Officer of Health shall, in the case of every ship certified to be infected, give directions and take such steps as may appear to him to be necessary for preventing the spread of infection, and the master of the said ship shall forthwith carry into execution such directions as shall be given to him.

"In the event of any death from cholera on board the master shall, as directed by the Medical Officer of Health, either cause the dead body to be taken out to sea and committed properly loaded to the deep, or shall deliver it into the charge of the Sanitary Authority for interment.

"The master shall cause any articles that may have been soiled with cholera discharges to be destroyed, and the clothing and bedding, and other articles of personal use likely to retain infection which have been used by any person who may have suffered from cholera on board such ship, or who, having left such ship, shall have suffered from cholera during the stay of such ship in any port, to be disinfected or (if necessary) destroyed; and if the master shall have neglected to do so before the ship arrives in port, he shall forthwith, under the direction of the Sanitary Authority or the Medical Officer of Health, cause the same to be disinfected or destroyed; and if the said master neglect to comply with such direction within a reasonable time, the Authority shall cause the same to be carried into execution. The master also, under the directions of the Medical Officer of Health, shall cause the ship to be disinfected, and every article therein, other than those last described, which may probably be infected with cholera.

"The master of every cholera-infected ship when within three miles of the coast of any part of England or Wales, to keep hoisted a yellow flag (commercial code signal Q) from sunrise to sunset."

In 1892 (September 6) another Order was issued as to the detention of any person on board an infected ship, unable to satisfy the Medical Officer of Health as to name, place of destination, and address, and also of passengers on a non-infected ship who are in a filthy or otherwise unwholesome condition. This Order also contains regulations as to the pumping out of bilge water from a ship infected with cholera or which has come from a place so infected, and for providing a proper supply of water for drinking and cooking purposes.

Since 1883 Orders have been issued from time to time with respect to rags imported from countries infected with cholera.

Appendix H.—Form of Certificate of Birth.

BIRTH OF A CHILD AT SEA ON BOARD.....						
Date of Birth.	Name.	Sex.	Name and Surname of Father.	Name and Maiden Surname of Mother.	Rank or Profession of Father.	Signature of Master of Ship.

Appendix I.—Form of Certificate of Death.

DEATH AT SEA ON BOARD						
Date of Death.	Name.	Sex.	Age.	Rank or Profession.	Cause of Death.	Signature of Master of Ship.

Appendix K.—Emergency Scale of Medicines and Medical Stores issued by the Board of Trade in pursuance of the Merchant Shipping Act, 1894.

Preparations from British Pharmacopœia, 1898. — This column is added for the use of Druggists supplying the Medicines indicated. All bottles to be stoppered, and the official dose for an adult to be stated on the label. All medicines indicated thus (*) to be marked with a Red Poison Label.	Names of Medicines, Medicaments, &c. — All Medicines bearing a Red Poison Label must be used with caution, and if given internally should be carefully measured.	Proportion for Ships irrespective of the number of men carried (for voyages of five days and under from Port to Port).
Sp. ammon. aromat., .	Aromatic spirits of ammonia.	2 oz.
Tinctura chloroformi et morphinæ comp.,	*Compound tincture of chloroform and morphine. (To be used in lieu of chlorodyne.)	1 „
Linimentum calcis, . .	Carron oil, . . . Castor oil, . . .	1 pint. $\frac{1}{2}$ „
Acidum carbolicum liquefactum,	*Carbolic acid, liquefied, .	2 oz.
Tinctura benzoini composita,	Friar's balsam, . . .	2 „
Liquor plumbi subacetatis,	*Goulard's extract, . .	2 „
Tinctura opii, . . .	*Laudanum, . . .	2 „
Linimentum opii, . . .	*Opodeldoc, . . .	4 „
Pilula colocynthidis composita (4 grs.)	Purgative pills, . .	3 „
Paraffinum molle, . .	Vaseline or salvo petrolia,	4 „

Particulars.	Scales of Medical Stores and Necessaries.	Proportion for Ships, irrespective of the number of men carried.
The fluid 2-oz. measure must be marked in <i>ounces</i> and <i>drams</i> , <i>table spoonfuls</i> and <i>tea spoonfuls</i> .	Rubber plaister, . . .	1 yard.
	Boric lint,	$\frac{1}{2}$ lb.
	Absorbent cotton wool, .	$\frac{1}{2}$ „
	Graduated drop measure,	1
	Graduated 2-oz. measure,	1
	6-oz. bottles with corks, .	6
	1-oz. bottles with corks, .	6
	Mustard leaves in tins, .	1 tin.
	Scissors,	1 pair.
	Lancet,	1
Base 48-in., sides 32-in., .	Triangular bandages, .	2
Leg and arm size, . . .	Bandages,	6
	Calico,	2 yards.
	Splints, common, . . .	1 set.
	Esmarch's tourniquet, .	1
	Needles in vaseline, . .	6
	Safety pins,	2 dozen.
	Tablet of silk with four sizes,	1
Printed directions for use,	Enema syringe (Higgen-son's),	1
36-in. single reversible .	Truss,	1
36-in. double	Do.,	1
	Authorised Book of Direc-tions,	1

NOTE.—Ships making voyages of less than 24 hours from port to port have the option of carrying only the small Ambulance Hamper of the St. John Ambulance Association, or its equivalent, in lieu of the above Scale.

Scale of Medicines, Medical Stores, Instruments, and Medical Comforts, for Ships clearing under Part III. of the Merchant Shipping Act, 1894, other than Steam Ships engaged in the North Atlantic trade. *Revised November, 1899.*

N.B.—There is a separate Scale for North Atlantic Emigrant Ships.

For every 100 Passengers where the length of the Passage, computed according to the Merchant Shipping Act, is under 100 days. Where the length of Passage is over 100 days, the quantities of Medicines and Medical comforts to be increased by one-half.

Directions for Druggists.	Articles.	Quantities per 100 Passengers.
		Pts. or lbs. oz. drs.
The Medicines to be prepared and plainly labelled in Latin and English names according to the British Pharmacopœia, and the official dose for an adult given in the Pharmacopœia to be stated on the label. All bottles to be stoppered, and all medicines indicated thus (*) to be marked with a Red Poison Label. The Proportion of all poisons should be stated on the labels. †For preparation of lime water.	Acidum boricum (in powder), . . .	0 3 0
	* „ carbolicum liquefactum, . . .	0 4 0
	„ citricum, . . .	0 1 0
	* „ hydrocyanicum dilutum, . . .	0 0 2
	* „ nitro - hydrochloricum dilutum. . .	0 4 0
	* „ sulphuricum dilutum, . . .	0 4 0
	* Æther, . . .	0 6 0
	Alumen, . . .	0 2 0
	Ammonii bromid, . . .	0 4 0
	Ammonii carbonas, . . .	0 3 0
	* Argenti nitras induratus, . . .	0 0 2
	Bismuthi carbonas, . . .	0 2 0
	Borax, . . .	0 2 0
	† Calcii hydras, . . .	0 1 0
	Camphor, . . .	0 3 0
	* Chloroformum, . . .	0 6 0
	* Collodium flexile, . . .	0 0 4
	Copaiba, . . .	0 4 0

Directions for Druggists.	Articles.	Quantities per 100 Passengers.
All bottles to be stoppered, and all medicines indicated thus (*) to be marked with a Red Poison Label.	Extractum cascariæ sagradæ liquidum,	Pts. or lbs. oz. drs. 0 2 0
	Extractum ergotæ liquidum, .	0 2 0
	„ hamamelidis liquidum,	0 1 0
	Ferri et ammonii citras, . .	0 1 0
	„ et quiniæ citras, . .	0 1 0
	Glycerinum,	0 8 0
	„ acidi tannici, . .	0 2 0
	*Hydrargyri subchloridum, . .	0 0 2
	Hydrargyrum cum cretâ, . .	0 0 4
	*Iodoformum,	0 1 0
Or in tablet form 3 doz. each tablet containing 2 grs. of solid extract.	‡Linum contusum,	6 0 0
	*Linimentum belladonnæ, . .	0 8 0
	* „ camphoræ ammoni- atum,	0 6 0
	* „ opii,	0 4 0
	„ saponis,	0 12 0
	Liquor ammonii acetatis, . .	0 8 0
	* „ arsenicalis,	0 0 4
	* „ atropinæ sulphatis, . .	0 0 2
	„ calcis,	0 8 0
	* „ epispasticus,	0 1 0
‡ Add 2 drs. of powdered camphor to each pound.	* „ ferri perchloridi fortior, .	0 0 4
	* „ hydrargyri perchloridi, .	0 6 0
	* „ iodi fortis,	0 1 0
	* „ morphinæ hydrochloridi, .	0 1 0
	* „ plumbi subacetatis, . .	0 2 0
	„ strychninæ hydrochloridi,	0 2 0
	Magnesiæ sulphas,	3 0 0
	Mistura sennæ composita, . .	5 0 0
	*Oleum crotonis,	0 0 1
	„ lini,	1 0 0
* „	„ olivæ,	0 8 0
	„ ricini,	1 0 0
	„ terebinthinæ,	0 6 0
	Paraffinum molle (Vaseline or Salvo Petrolia),	0 12 0
	*Phenacetinum,	0 0 4

Directions for Druggists.	Articles.	Quantities per 100 Passengers.
All bottles to be stoppered, and all medicines indicated thus (*) to be marked with a Red Poison Label.	†Pilula colocynthidis composita (4 grs.).	4 doz.
	„ hydrargyri (4 grs.).	3 „
	„ plumbi cum opio (2 grs.).	1 „
	„ rhei composita (4 grs.).	4 „
	„ saponis composita (2 grs.).	3 „
	„ scillæ composita (4 grs.).	3 „
		Pts. or lbs. oz. drs.
† All pills to be coated with gelatine.	Potassii bicarbonas,	0 4 0
	„ chloras,	0 4 0
	„ iodidum,	0 4 0
	„ nitras,	0 1 0
‖Directions for making the liquor to be on the bottle.	„ permanganas,	0 4 0
	Pulvis cretæ aromaticus,	0 2 0
	„ glycyrrhizæ compositus,	0 4 0
	„ ipecacuanhæ,	0 1 0
	* „ ipecacuanhæ compositus,	0 1 0
	„ jalapæ compositus,	0 1 0
	Quininæ sulphas,	0 2 0
	Sodii bicarbonas,	0 6 0
	„ salicylas,	0 3 0
	Spiritus ætheris nitrosi,	0 8 0
	„ ammoniæ aromaticus,	0 6 0
	„ chloroformi,	0 3 0
	„ menthæ-piperitæ,	0 1 0
	„ rectificatus,	0 6 0
	*Sulphonal (in powder),	0 0 4
	*Syrupus chloral,	0 5 0
‡Irrespective of number of passengers.	*†Tabellæ trinitrini,	0 1 0
	*Tinctura arnicæ,	0 1 0
	* „ belladonnæ,	0 1 0
	„ benzoini composita,	0 2 0
	* „ camphoræ composita,	0 4 0
	„ cardamomi composita,	0 6 0
	„ catechu,	0 2 0
	* „ chloroformi et morphinæ composita,	0 1 0
	* „ digitalis,	0 1 0
	* „ ferri perchloridi,	0 2 0
	„ gentianæ composita,	0 6 0
	„ hyoscyami,	0 2 0
	* „ opii,	0 4 0
	„ scillæ,	0 2 0
	„ senegæ,	0 4 0

Directions for Druggists.	Articles.	Quantities per 100 Passengers.
All bottles to be stoppered, and all medicines indicated thus (*) to be marked with a Poison Label. † 1 drm. to the oz. of white or yellow wax should be incorporated in all ointments.	Tinctura zingiberis, . . .	Pts. or lbs. oz. drs. 0 2 0
	† Unguentum acid borici, . . .	0 8 0
	„ gallæ cum opio, . . .	0 1 0
	„ hydrargyri, . . .	0 2 0
	„ hydrargyri ammoniati, . . .	0 4 0
	„ hydrargyri oxidi flavi, . . .	0 2 0
	„ sulphuris, . . .	0 10 0
	„ zinci, . . .	0 8 0
	* Vinum antimoniale, . . .	0 1 0
	„ colchici, . . .	0 1 0
	„ ipecacuanhæ, . . .	0 4 0
	Zinci oxidum, . . .	0 4 0
	„ sulphas, . . .	0 1 0
	Hypodermic injection case, with syringe, nickel-plated needles, and tablets or discs of—	
	Tartrate of morphine ($\frac{1}{4}$ gr.),	2 doz.
Irrespective of number of passengers. ‡ A powder containing not less than 20 per cent. of pure carbolic or cresylic acid. The powder to be securely packed in tin canisters containing not more than 4 lbs. in each tin. § A liquid containing not less than 80 per cent. of free carbolic or cresylic acid.	Sulphate of atropine ($\frac{1}{100}$ gr.),	1 „
	Hydrochloride of cocaine ($\frac{1}{4}$ gr.),	2 „
	Apomorphinæ hydrochloridum ($\frac{1}{10}$ gr.),	1 „
	† Disinfectants—	
	‡ Carbolic acid powder, or other disinfectant powder of approved quality,	1 cwt.
	§ Commercial carbolic acid, or other disinfectant of approved quality,	2 galls.
	Sulphur for fumigation, . . .	5 lbs.
	* Tablets of perchloride of mercury, each to make a quart of solution (1 in 1000),	100

+ Samples of the disinfectants supplied will be occasionally taken for analysis to determine whether they fulfil the requirements of the Board of Trade.

Medical Stores.

Directions for Druggists.	Articles.	Quantities per 100 Passengers.
Maximum 3 lbs.	Lint,	8 ozs.
	Boric lint,	8 „
	Absorbent cotton wool,	1 lb.
	Strapping (rubber plaster),	3 yds.
	Tow,	1 lb.
§§ Under 200 passengers, 1 bottle. From 200 and under 400 passengers, 2 bottles; 400 passengers and over, 3 bottles.	§§ Sponges aseptically prepared, in hermetically sealed bottles, containing one dozen.	
6 yds. long, 3 ins. wide	Bed pan,	1
6 „ 6 „	Leg and arm bandages,	2 doz.
Base 48 ins., sides 33 ins. each.	Flannel ditto,	3
	Triangular ditto,	3
	Calico for bandages,	3 yds.
	Flannel,	3 „
Maximum 3 lbs.	Gamgee tissue,	1 lb.
	Double cyanide gauze,	2 yds.
	**Oiled silk, or substitute prepared by Messrs. Christy & Co.	1 yd.
**Only the quantities named of these articles to be provided irrespective of the number of passengers.	**Waterproof sheeting,	4 yds.
	Trusses—Double 36 in.,	1
	Reversible 30 in.,	1 single
	„ 36 in.,	1 „
Waterproofsheeting may be of single texture, but must be at least 3 feet wide.	**Safety pins,	5 doz.
	**Mustard leaves,	2 tins
	Plaster of Paris for bandages,	1 lb.
	**Set of Cline's splints,	1
	**Macintyre's splint,	1
Under 500 passengers, 4 sq. ft.	Cardboard or perforated felt for splints.	
500 passengers and over, 6 sq. ft.	**Minim measure,	2
	**Ounce ditto,	1
	**3 ounce ditto,	2
	**Stomach tube with glass funnel,	1
†† Under 500 passengers, 2.	†† Higginson's enema syringes,	
500 passengers and over, 4.	Glass or pewter syringes, $\frac{1}{2}$ oz.,	6
	**Box of small scales and weights,	1

Medical Stores.—*Continued.*

Directions for Druggists.	Articles.	Quantities per 100 Passengers.
**Only the quantities named of these articles to be provided irrespective of the number of passengers. The filter must be tested in the Government Laboratories. ‡‡Under 500 passengers, 1 doz. 500 passengers and over, 2 doz. §§Under 500 passengers, 2 doz. 500 passengers and over, 4 doz.	**Iron basin, enamelled white (for lotions),	1
	**Wedgwood mortar and pestle, .	1
	**Enamelled Iron aseptic dressing tray (triangular shape),	1
	**Wedgwood funnels,	2
	**Spatulas,	2
	Bottles for medicines, 2 oz., .	2 doz.
	" " 8 oz., .	4 "
	‡‡Fluted bottles for external application, 2 oz.	
	‡‡Fluted bottles for external application, 6 oz.	
	**A 2-gallon Pasteur-Chamberland filter or other approved filter of like capacity capable of delivering water free from micro-organisms,	1
	Corks, assorted,	6 doz.
	Gallipots,	6
	Packets of nested pill boxes, .	1
	Blank labels,	6 doz.
	Poison labels,	2 "
	**Dispensary paper (white demy),	1 qr.
	Camel's hair pencil brushes, .	3
	**Æther inhaler,	1
	**Urinary test case (containing urinometer, spirit lamp, litmus paper, 12 test tubes, Nitric acid, and Liq. Potassæ 2 oz.).	
	§§Glycerinated Calf Lymph in tubes.	
	**Authorised Book of Directions for Medicine Chests (<i>The Ship Captain's Medical Guide</i> , latest edition).	
	**British Pharmacopœia.	

Instruments.

In pocket case.	1 Artery forceps.	2 Scalpels.
	1 Dressing do.	1 Hernia knife.
	1 Finger knife.	1 " director.
	1 Curved bistoury, sharp pointed.	2 Trocars and canulas.
	1 Curved bistoury, blunt pointed.	1 Aneurism needle.
	2 Probes.	1 Set tooth instruments (7 forceps in leather roll).
	1 Silver director.	1 Set tracheotomy instruments (3 double tubes and trachea dilator).
	1 Caustic case.	1 Set midwifery instruments (long forceps), in leather roll.
	1 Scissors.	1 Esmarch's tourniquet (plain with hooks).
	1 Spatula.	1 Esophageal probang with bristles.
	2 Lancets.	1 Aspirator with 2 needles in case.
	1 Gum lancet.	3 Silver catheters (Nos. 4 & 8; and No. 12 with prostatic curve).
	12 Needles in vaseline.	1 Full set of soft olive-headed catheters.
	1 Tablet of silk with four sizes	2 Clinical thermometers, self-registering.
	1 Fergusson's small saw.	1 Stethoscope.
	1 Amputating saw.	1 ft. Drainage tubing (No. 10 gauge).
	2 " knives.	1 Length silkworm gut ligature.
	1 Pair large dissecting forceps.	
	1 Bone forceps (bent).	
	2 Pairs Well's pressure forceps.	
	1 Trephine ($\frac{3}{8}$ in. size).	
	1 Elevator.	
	1 Trephine brush.	
	1 Eye spud.	

Medical Comforts.

Articles.	Quantities per 100 Passengers.
Arrowroot,	7 lbs.
Pearl barley,	5 "
Semolina,	10 "
Essence of extract of beef, of approved quality, . . .	20 $\frac{1}{2}$ -lb. tins.
Condensed milk, of approved quality,	30-lb. tins.
Brandy,	1 gallon.

Scale of Medicines, Medical Stores, Instruments, and Medical Comforts for North Atlantic Emigrant Ships only, where the voyage computed according to the Merchant Shipping Act, 1894, does not exceed 37 days. *Revised November, 1899.*

N.B.—There is a separate scale for Emigrant Ships for longer voyages.

Directions to Druggists.	Articles.	1 For 100 Passen- gers.	2 For 250 Passen- gers.	3 For 500 Passen- gers.	4 For 750 Passen- gers and upwards.
The medicines to be prepared plainly labelled in Latin and English names according to the British Pharmacopœia, and the official dose for an adult given in the Pharmacopœia to be stated on the label. All bottles to be stoppered, and all medicines indicated thus (*) to be marked with a Red Poison Label.	Acidum boricum (in powder), .	2 oz.	3 oz.	4 oz.	5 oz.
	* „ carbolicum liquefactum.	2 „	3 „	4 „	5 „
	„ citricum,	1 „	2 „	3 „	4 „
	* „ nitro-hydrochloricum dilutum.	2 „	4 „	6 „	8 „
	„ sulphuricum dilutum,	2 „	4 „	6 „	8
	*Æther,	3 „	6 „	9 „	12 „
	Ammonii bromidum, . .	4 „	8 „	12 „	16 „
	Ammonii carbonas, . . .	1 „	2 „	2 „	4 „
	*Argenti nitras induratus, .	2 drs.	2 drs.	4 drs.	4 drs.
	Bismuthi carbonas, . . .	1 oz.	2 oz.	3 oz.	4 oz.
The proportion of all poisons should be stated on the labels. The weights and measures of the British Pharmacopœia to be used.	†Calcii hydras,	1 „	1 „	1 „	1 „
	Camphor,	1 „	2 „	3 „	4 „
	*Chloroformum,	3 „	6 „	9 „	12 „
	*Collodium flexile,	2 „	4 „	4 „	4 „
	Copaiba,	2 „	4 „	6 „	6 „
†For preparation of lime water.	†Extractum cascariæ sagradæ liquidum.	1 „	2 „	3 „	4 „
	„ ergotæ liquidum,	1 „	1 „	2 „	2 „
	„ hamamelidis liquidum.	1 „	1 „	2 „	2 „
	Glycerinum,	6 „	8 „	10 „	16 „
	*Hydrargyri subchloridum, .	2 drs.	4 drs.	6 drs.	8 drs.
	Hydrargyrum cum cretâ, .	2 „	4 „	6 „	8 „
	*Iodoformum,	1 oz.	1 oz.	2 oz.	2 oz.
	†Or in tablet form, each tablet containing 2 grs. of solid extract, 2, 3, 4 and 6 doz.				

Directions to Druggists.	Articles.	1 For 100 Passen- gers.	2 For 250 Passen- gers	3 For 500 Passen- gers.	4 For 750 Passen- gers and upwards.
*To be marked with a Red Poison Label. See directions in col. 1, p. 332. ¶Add 2 drs. of powdered camphor to each pound.	¶Linum contusum, . . .	5 lbs.	7 lbs.	9 lbs.	12 lbs.
	*Linimentum belladonnæ, .	6 oz.	9 oz.	12 oz.	16 oz.
	* „ camphoræ ammo- niatum.	6 „	9 „	12 „	16 „
	* „ opii, . . .	6 „	9 „	12 „	16 „
	„ saponis, . . .	8 „	12 „	16 „	20 „
	Liquor ammonii acetatis, .	6 „	8 „	10 „	12 „
	* „ arsenicalis, . . .	$\frac{1}{2}$ „	$\frac{1}{2}$ „	1 „	1 „
	„ calcis, . . .	8 „	8 „	16 „	16 „
	* „ epispasticus, . . .	1 „	1 „	2 „	2 „
	* „ ferri perchloridi fortior,	$\frac{1}{2}$ „	$\frac{1}{2}$ „	1 „	1 „
	* „ hydrargyri perchloridi,	4 „	6 „	8 „	12 „
	* „ iodi fortis, . . .	1 „	2 „	3 „	4 „
	* „ plumbi subacetatis, .	1 „	2 „	3 „	4 „
	* „ strychninæ hydro- chloridi.	1 „	1 „	2 „	2 „
	Magnesiæ sulphas, . . .	2 lbs.	4 lbs.	8 lbs.	16 lbs.
	Mistura sennæ composita, .	2 pts.	4 pts.	6 pts.	8 pts.
	*Oleum crotonis, . . .	1 dr.	1 dr.	1 dr.	1 dr.
	„ lini, . . .	1 pt.	2 pts.	3 pts.	4 pts.
	„ olivæ, . . .	4 oz.	6 oz.	8 oz.	12 oz.
	„ ricini, . . .	1 pt.	1 pt.	2 pts.	2 pts.
	* „ terebinthinæ, . . .	6 oz.	8 oz.	10 oz.	12 oz.
	Paraffinum molle (Vaseline or Salvo Petrolia).	12 „	16 „	20 „	20 „
	*Phenacetinum, . . .	1 „	2 „	3 „	4 „
†All pills to be coated with gelatine.	†Pilula colocynthidis composita (4 grs.).	4 doz.	6 doz.	8 doz.	10 doz.
	„ hydrargyri (4 grs.), .	3 „	4 „	6 „	8 „
	„ plumbi cum opio (2 grs.),	3 „	4 „	6 „	8 „
	„ rhei composita (4 grs.), .	4 „	6 „	8 „	12 „
	„ saponis composita (2 grs.),	3 „	4 „	6 „	8 „

Directions to Druggists.	Articles.	1 For 100 Passen- gers.	2 For 250 Passen- gers.	3 For 500 Passen- gers.	4 For 750 Passen- gers and upwards.
*To be marked with a Red Poison Label. See direc- tions in col. 1, p. 332.	Potassii bicarbonas, . . .	4 oz.	8 oz.	12 oz.	16 oz.
	„ chloras, . . .	4 „	8 „	12 „	16 „
	„ iodidum, . . .	4 „	8 „	12 „	16 „
	„ nitras, . . .	1 „	2 „	3 „	4 „
Directions for making the liquor to be on the bottle.	„ permanganas, . . .	4 „	8 „	12 „	16 „
	Pulvis cretæ aromaticus, . .	4 „	6 „	8 „	12 „
	„ glycyrrhizæ compositus, .	4 „	6 „	8 „	12 „
	* „ ipecacuanhæ compositus, .	4 drs.	6 drs.	8 drs.	12 drs.
	Quininæ sulphas, . . .	1 oz.	2 oz.	3 oz.	4 oz.
	Sodii bicarbonas, . . .	4 „	8 „	12 „	16 „
	„ salicylas, . . .	4 „	6 „	8 „	10 „
	Spiritus ætheris nitrosi, . .	8 „	10 „	12 „	16 „
	„ ammoniæ aromaticus, . .	6 „	10 „	15 „	20 „
	„ chloroformi, . . .	3 „	4 „	6 „	8 „
	„ menthæ-piperitæ, . .	1 „	1 „	2 „	2 „
	„ rectificatus, . . .	6 „	8 „	10 „	12 „
	*Sulphonas (in powder), . .	1 „	2 „	3 „	4 „
	*Syrupus chloral, . . .	2 „	4 „	6 „	8 „
	*Tabellæ trinitrini, . . .	$\frac{1}{2}$ „	$\frac{1}{2}$ „	$\frac{1}{2}$ „	$\frac{1}{2}$ „
	*Tinctura arnicæ, . . .	1 „	2 „	3 „	4 „
	„ benzoini composita, . .	2 „	4 „	6 „	8 „
	„ camphoræ composita, . .	8 „	12 „	16 „	20 „
	„ cardamomi composita, . .	6 „	8 „	10 „	12 „
	„ catechu, . . .	2 „	4 „	6 „	8 „
	* „ chloroformi et mor- phine composita, . . .	1 „	2 „	3 „	4 „
	* „ digitalis, . . .	2 „	4 „	6 „	8 „
	* „ ferri perchloridi, . .	2 „	4 „	6 „	8 „
	„ gentianæ composita, . .	4 „	6 „	8 „	10 „

Directions to Druggists.	Articles.	1 For 100 Passen- gers.	2 For 250 Passen- gers.	3 For 500 Passen- gers.	4 For 750 Pas- en- gers and upwards.
*To be marked with a Red Poison Label. See directions in col. 1, p. 332. †1 dr. to the oz. of white or yellow wax should be incorporated in all ointments.	*Tinctura opii,	2 oz.	4 oz.	6 oz.	8 oz.
	„ scillæ,	2 „	4 „	6 „	8 „
	„ senegæ,	4 „	8 „	12 „	16 „
	„ zingiberis,	2 „	2 „	4 „	4 „
	†Unguentum acidi borici, . .	2 „	4 „	6 „	8 „
	„ gallæ cum opio, . .	2 „	2 „	4 „	4 „
	„ hydrargyri, . .	1 „	1 „	2 „	2 „
	„ „ ammoniati, . .	1 „	2 „	3 „	4 „
	„ sulphuris, . .	10 „	15 „	20 „	20 „
	„ zinci,	8 „	12 „	16 „	20 „
	*Vinum antimoniale, . .	1 „	1 „	2 „	2 „
	„ colchici,	1 „	1 „	2 „	2 „
	„ ipecacuanhæ,	4 „	6 „	8 „	12 „
	Zinci oxidum,	1 „	2 „	3 „	4 „
	„ sulphas,	1 „	2 „	3 „	4 „
‡A powder containing not less than 20 per cent. of pure carbolic or cresylic acid. The powder to be securely packed in tin canisters containing not more than 4 lbs. in each tin. §A liquid containing not less than 80 per cent. of free carbolic or cresylic acid.	Hypodermic injection case with syringe, nickel-plated needles and tablets or discs of—				
	Tartrate of morphine ($\frac{1}{4}$ gr.)	2 doz.	3 doz.	4 doz.	6 doz.
	Sulphate of atropine ($\frac{1}{100}$ gr.).	1 „	1 „	2 „	2 „
	Hydrochloride of cocaine ($\frac{1}{4}$ gr.).	2 „	4 „	6 „	8 „
	Apomorphinæ hydrochloridum ($\frac{1}{20}$ gr.).	1 „	1 „	1 „	1 „
	†Disinfectants—				
	‡Carbolic acid powder, or other disinfectant powder of approved quality.	1 cwt.	2 cwt.	3 cwt.	4 cwt.
	§Commercial carbolic acid, or other disinfectant of approved quality.	1 gall.	2 gals.	3 gals.	4 gals.
	Sulphur for fumigation, . .	5 lbs.	10 lbs.	20 lbs.	30 lbs.
	*Tablets of perchloride of mercury, each to make a quart of solution (1 in 1000).	100	100	100	100

† Samples of the disinfectants supplied will be occasionally taken for analysis to determine whether they fulfil the requirements of the Board of Trade.

Medical Stores.

Directions to Druggists.	Articles.	1 For 100 Passen- gers.	2 For 250 Passen- gers.	3 For 500 Passen- gers.	4 For 750 Passen- gers and upwards.
6 yds. long, 3 in. wide 6 " 6 " Base 48 in., sides 33 in. each.	Lint,	4 oz.	6 oz.	10 oz.	14 oz.
	Boric lint,	3 "	6 "	9 "	12 "
	Absorbent cotton wool, . .	1 lb.	2 lbs.	3 lbs.	4 lbs.
	Strapping (Rubber plaster), .	2 yds.	3 yds.	4 yds.	6 yds.
	Bed-pan,	2	2	4	4
	Leg and arm bandages, . .	1 doz.	2 doz.	3 doz.	4 doz.
	Flannel bandages,	2	3	4	4
	Triangular bandages, . . .	2	2	3	3
	Calico for bandages, . . .	3 yds.	4 yds.	5 yds.	6 yds.
	Gamgee tissue,	2 "	4 "	5 "	6 "
	Double cyanide gauze, . . .	2 "	3 "	4 "	5 "
	Oiled silk, or substitute pre- pared by Messrs. Christy & Co.	1 "	1 "	1 "	1 "
	*Waterproof sheeting, . . .	4 "	4 "	4 "	4 "
*May be of single texture but must be at least 3 feet wide.	Safety pins,	3 doz.	3 doz.	6 doz.	6 doz.
	Mustard leaves,	2 tins.	2 tins.	2 tins.	2 tins.
	Plaster of Paris bandages (in tins) prepared for use.	1 doz.	1 doz.	1 doz.	1 doz.
	Set of Cline's splints, . . .	1	1	1	1
	MacIntyre's splint,	1	1	1	1
	Trusses, single, reversible 30 in.,	1	1	2	2
	" " " 36 "	1	1	2	2
	" double 36 in.,	1	1	2	2
	Cardboard, gutta-percha, or perforated felt for splints, .	2 sq. ft.	2 sq. ft.	4 sq. ft.	4 sq. ft.
	Minim measure,	2	2	2	2
	Ounce "	1	1	1	1
	3-ounce "	1	1	1	1
	Stomach tube with glass funnel,	1	1	1	1
	Higginson's enema syringe, .	1	1	2	2
	Glass or pewter syringes, $\frac{1}{2}$ -oz.,	6	9	12	15

Medical Stores—*Continued.*

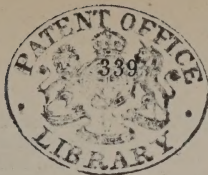
Directions to Druggists.	Articles.	1 For 100 Passen- gers.	2 For 250 Passen- gers.	3 For 500 Passen- gers.	4 For 750 Passen- gers and upwards.
	Box of small scales and weights,	1	1	1	1
	Wedgwood mortar and pestle,	1	1	1	1
	„ funnels,	2	2	2	2
	Iron basin, enamelled white (for lotions).	1	1	1	1
	Enamelled iron aseptic dressing tray (triangular shape).	1	1	1	1
	Spatulas,	2	2	2	2
	Sponges, aseptically prepared, in hermetically sealed bottles containing 1 dozen.	1	1	2	2
	Bottles, for medicines, 2 oz., .	1 doz.	2 doz.	3 doz.	3 doz.
	„ „ 8 oz., .	2 „	4 „	6 „	8 „
	Fluted bottles for external applications, 2 oz.,	1 „	1 „	2 „	2 „
	„ „ 6 oz.,	1 „	1 „	2 „	2 „
	Corks, assorted,	6 „	10 „	15 „	20 „
	Chip ointment boxes, . .	1 „	1 „	2 „	2 „
	Packets of nested pill boxes, .	1	2	3	4
	Blank labels,	6 doz.	10 doz.	15 doz.	20 doz.
	Poison labels,	2 „	4 „	6 „	8 „
	Dispensary paper, white demy,	$\frac{1}{2}$ qr.	$\frac{1}{2}$ qr.	1 qr.	1 qr.
	Camel's hair pencil brushes, .	3	4	6	6
	Æther inhaler,	1	1	1	1
	Urinary test case, containing spirit lamp, 6 test tubes, nitric acid and Liquor Potassæ, 2 oz.	1	1	1	1
	Glycerinated calf lymph in tubes.	1 doz.	2 doz.	3 doz.	4 doz.
	Authorised Book of Directions for Medicine Chests ("The Ship Captain's Medical Guide," latest edition).				
	British Pharmacopœia.				

Instruments.

In Pocket Case.	1 Artery forceps.	1 Trephine brush.
	1 Dressing „	1 Eye Spud.
	1 Finger knife.	2 Scalpels.
	1 Curved Bistoury, sharp pointed.	1 Hernia knife.
	1 Curved Bistoury, blunt pointed.	1 Hernia director.
	2 Probes.	2 Trocars and canulas.
	1 Silver director.	1 Aneurism needle.
	1 Caustic case.	1 Set of tooth instruments (7 forceps) in leather roll.
	1 Scissors.	1 Set of tracheotomy instruments (3 double tubes and trachea dilator).
	1 Spatula.	1 Set midwifery instruments (long forceps) in leather roll.
	2 Lancets.	1 Esmarch's tourniquet (plain with hooks).
	1 Gum lancet.	1 Oesophageal probang with bristles.
	12 Needles in vaseline.	1 Aspirator with two needles in case.
	Tablet of silk with 4 sizes.	1 Length silkworm gut ligature.
	1 Ferguson's small saw.	3 Silver catheters (Nos. 4 and 8, and No. 12 with prostatic curve).
	1 Amputating saw.	1 Full set of soft olive-headed catheters.
	2 Amputating knives.	2 Clinical thermometers, self - registering.
	1 Pair large dissecting forceps.	1 Stethoscope.
	1 Bone forceps (bent).	1 ft. drainage tubing (No. 10 gauge).
	2 Pair Wells' pressure forceps.	
	1 Trephine, $\frac{3}{4}$ in. size.	
	1 Elevator.	

Medical Comforts.

Articles.	Quantities per 100 Passengers.
Arrowroot,	7 lbs.
Pearl barley,	5 „
Semolina,	7 „
Condensed milk of approved quality,	15 lb. tins.
Essence or extract of beef of approved quality,	15 $\frac{1}{4}$ -lb. tins.
Brandy,	1 gallon.



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